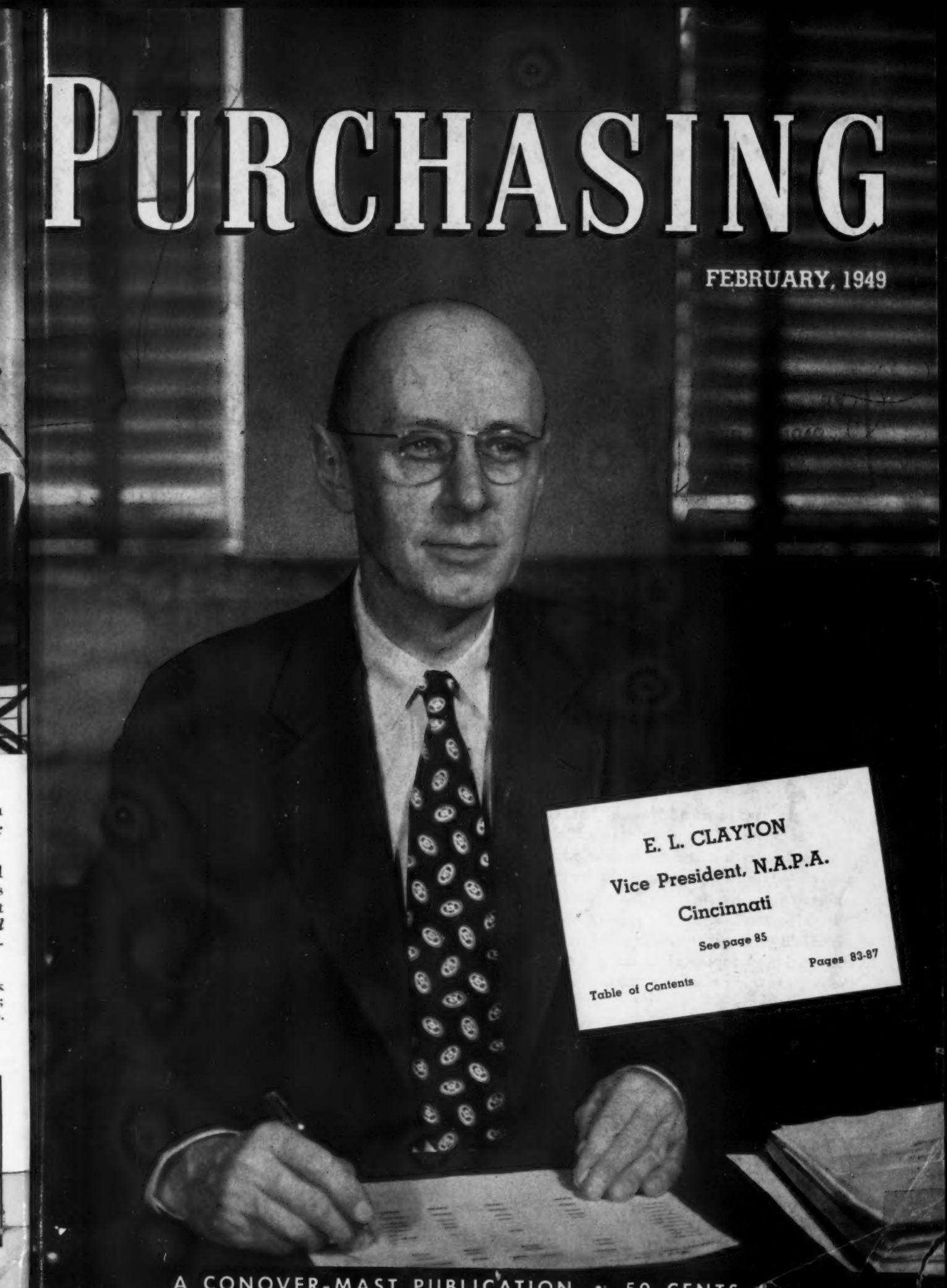
PURCHASING

FEBRUARY, 1949



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TURN your lubricating jobs over to Texaco and you can be sure that your machinery will turn in new records for smooth, trouble-free performance . . . assuring greater production at lower unit cost.

You get these benefits because: 1) Texaco Lubricants are skillfully "engineered" for their specific lubricating jobs; and 2) Texaco Lubrication Engineers—men with years of practical experience—bring to your plant the know-how of selecting and properly using the right lubricants for best results on every job.

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TECHNOLOGY DEPARTMENT

Century Announces a Line of Completely NEW Jet Pump Motors

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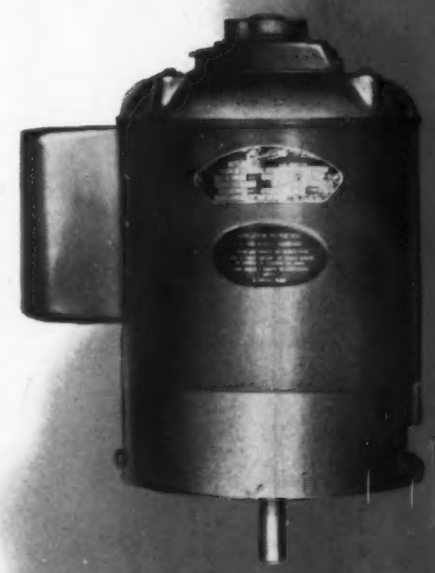


Century ½ horsepower
jet pump motor with keyed shaft

Century ½ horsepower
jet pump motor with threaded shaft

Designed for automatic starting and stopping, these motors have the starting and accelerating torque and speed characteristics especially suited to jet pump service.

The new capacitor start single phase jet pump motors are built to NEMA standards of performance and dimensions. Three phase and direct current motors have identical mounting dimensions—making them interchangeable.

Century Jet Pump motors are ruggedly constructed and carefully balanced to assure a long life of dependable operation, under the frequently abnormal conditions surrounding pump installations.

Century builds a complete line of motors in a variety of kinds and types—in sizes from 1/6 to 400 horsepower.

Specify Century motors for all your electric power requirements.

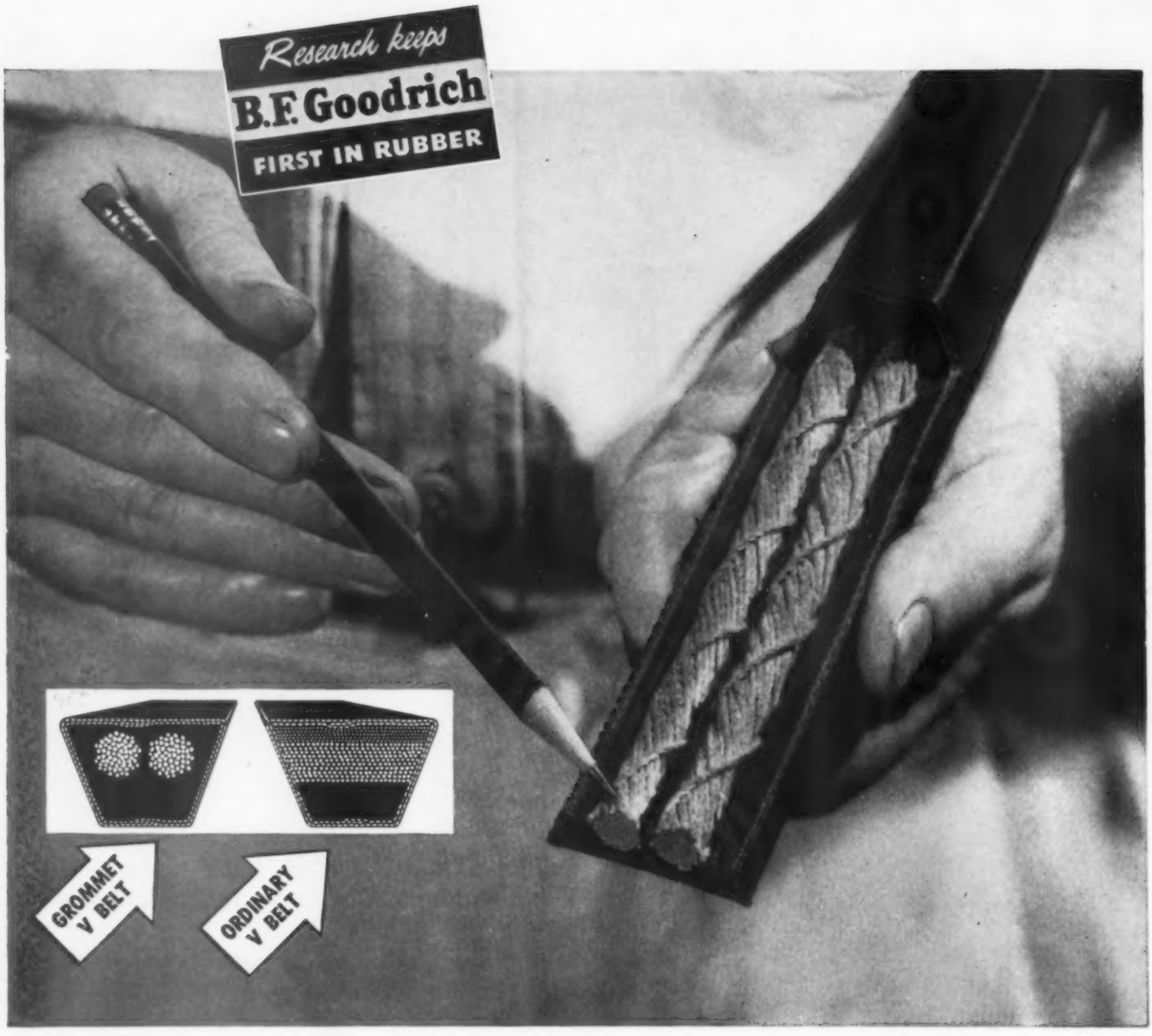
Popular types and standard ratings are generally available from factory and branch office stocks.

CENTURY ELECTRIC COMPANY
1806 Pine St., Saint Louis 3, Missouri
Offices and Stock Points in Principal Cities

Century C MOTORS

616

PURCHASING, published monthly, by PEEAYE, INC., subsidiary CONOVER-MAST PUBLICATIONS, INC. Publication Office, Orange, Conn. Editorial and Executive Offices 205 East 42nd St., New York 17, N. Y. Entered as second class matter August 8, 1942, at the Post Office in Orange, Conn., under the act of March 3, 1879. Subscription rates: United States; U. S. Possessions and Canada: $4 per year, $6 for two years; elsewhere $6 per year, $9 for two years. Single copies 50c. Volume XXVI, No. 2.



This V belt will cut your belt costs 20% to 50%

Only B.F.Goodrich makes the grommet belt—there's no other like it

THE B.F.Goodrich patented grommet belt lasts 20 to 50 per cent longer but costs no more than an ordinary V belt.

A grommet is *not a cable.* It is made by winding heavy cord *on itself* in an endless loop. (Cables are simply twisted cords; ends must be overlapped or spliced.)

Better than multiple cords. In a grommet belt all the cords work *all the time.* There are no cords in the *center* of the belt — which in an ordinary belt don't pull their share of the load.

More flexible. There is no splice, no stiff section where cords overlap. (85% of failures of ordinary belts occur in overlapped sections.) BFG belts have twin grommets, no fabric or plies in the middle of the belt that stiffen it and generate heat.

Stand shocks. Grommet belts run cooler, are stronger, have more *elasticity* but less *permanent* stretch than any other kind of belt. They stand sudden shock. Both laboratory and field tests have proved that they outlast all others, especially on hard drives.

Large sizes only. At present grommet belts are made only in largest sizes (D and E sections). Later, other sizes may be made.

More information. If you buy or use large-size V belts, don't do without the advantages grommet belts can give you. Talk to your BFG distributor. Or write, if you wish, for leaflet 2170. Address Dept. L-10, *The B.F.Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich
RUBBER FOR INDUSTRY

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Inland Steel, too, Is Made to *Your* Specifications

• Your corner pharmacist takes pride in compounding your prescriptions carefully and accurately. We at Inland Steel deal in prescriptions, too—your *steel* prescriptions. Being a completely integrated and independent steel company, we are able to supply steel to meet the specific requirements of your job . . . to act quickly when fast action is necessary . . . to maintain a friendly, personal interest in your steel problems . . . and to follow your steel order carefully, step by step, through each phase of production.

INLAND STEEL CO., 38 S. Dearborn St., Chicago, Ill.
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TRACK ACCESSORIES

. . . and
This "Inland Team"
Gives Your Steel
Their Personal Attention

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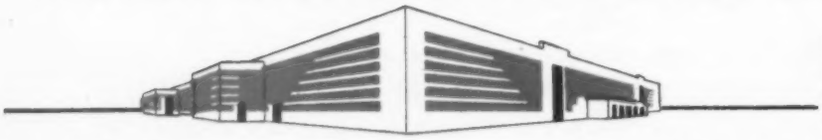
. . . and SOLD ONLY THROUGH TOP DISTRIBUTORS



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FOR METAL, WOOD, PAPER, PLASTICS

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Continuous cleaning of conveyor chain with brushes simplifies maintenance at General Electric Refrigerator Plant

The new conveyor method of assembly employed at the General Electric Refrigerator Plant, Erie, Pa., is the last word in modern production practices. Here, starting with a compressor unit, a new General Electric Refrigerator literally grows before your eyes as it moves from one operation to another at a speed of 27 feet per minute.

But new ideas create new maintenance problems. At one point in the operation the conveyor chain passes through a rust-proofing solution. This results in a deposit of scale which must be removed from the chain. At first the chain was removed and cleaned in a caustic solution —obviously a costly and time-consuming operation.

Then an Osborn sales engineer was asked for suggestions. The answer and solution is shown above. An Osborn Disc Center Wire Brushing Wheel is mounted on either side of the chain. Revolving with the chain as it emerges from the bath, the brushes remove all dirt and scale. Cleaning is instant and continuous at a mere fraction of former costs.

Time and money-saving ideas such as this are the stock-in-trade of Osborn sales engineers. It's the application that counts and the brushes are only the means to an end. This premium service costs you nothing, may save you much. For complete information write—

THE OSBORN MANUFACTURING COMPANY
5401 Hamilton Avenue *Cleveland, Ohio*

Osborn Brushes

WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY • POWER DRIVEN BRUSHES • PAINT BRUSHES • MAINTENANCE BRUSHES

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Don't half-mechanize...

GO ALL THE WAY
in Materials Handling

Going all the way means using power industrial trucks of the RIDDEN type. It means putting speed into your wheels—*3 times faster* than a hand-led truck.

It means handling *much larger* loads—loads that can be efficiently and safely high-tiered, or wheeled outside the department entirely, yet as accessible as if they had remained there.

It means *savings in man-hours*—savings that are vital with common labor scarce and almost prohibitive in cost.

Transportation is the product of tonnage by time. Why not save both instead of one? Don't ask your walking-talking operator to be pushed around by a machine—*put him on it, where it's safe; make him master of the whole job.*

Elwell-Parker builds power industrial trucks of the RIDDEN type *only.* Have an EP man show you how "Going All The Way" will substantially cut your materials handling costs. The Elwell-Parker Electric Company, 4519 St. Clair Ave., Cleveland 14, O.

FREE BOOKLET ON SCIENTIFIC MATERIALS HANDLING

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POWER INDUSTRIAL TRUCKS
Established 1893

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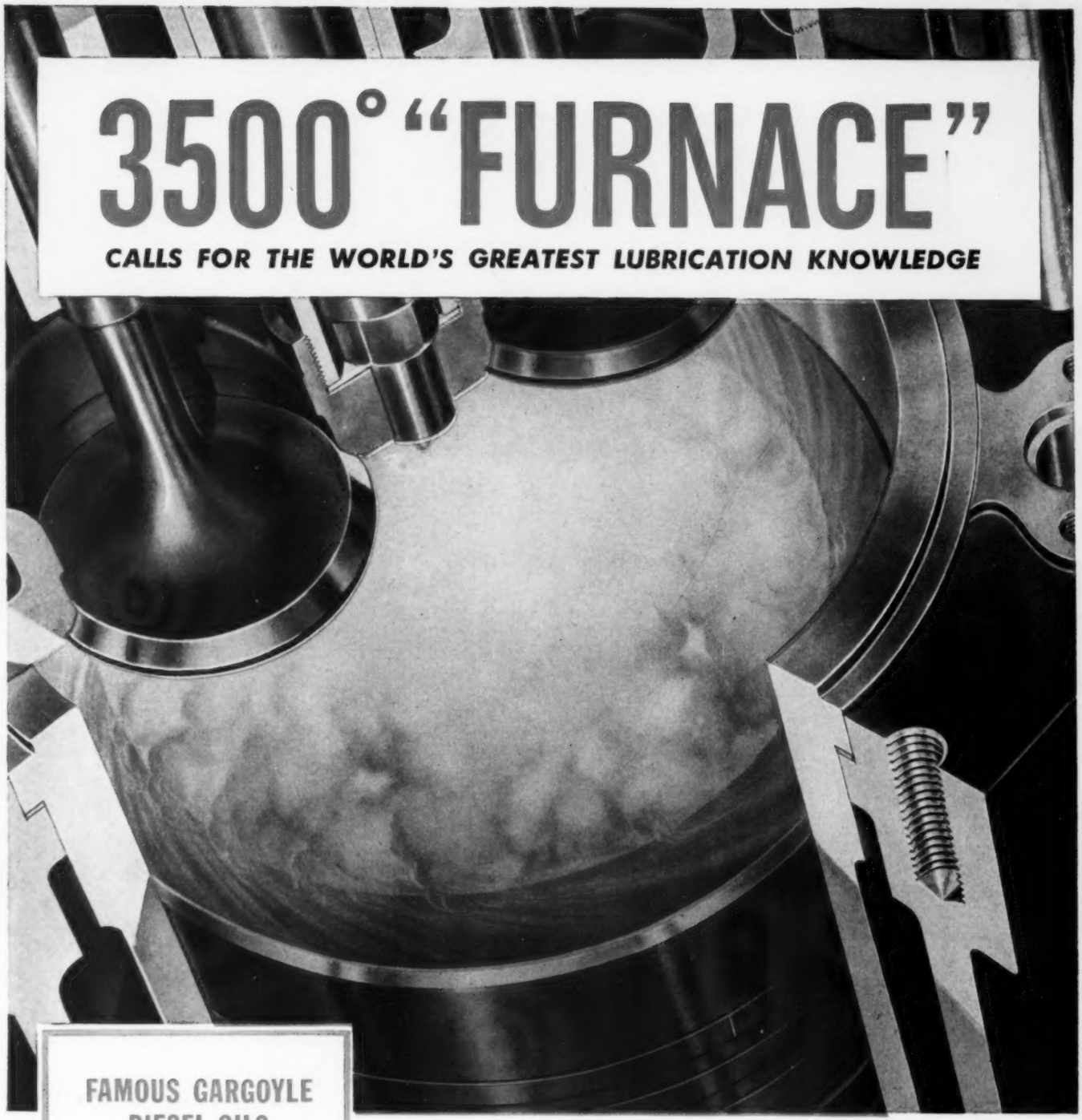

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This blinding flash is combustion inside a Diesel engine. It sends temperatures to 3,500°F., a grueling test for lubrication oil. For 50 years—ever since the first Diesel—the makers of Gargoyle lubricants have continuously improved oils to meet this test. This year, we've come up with another advance—improved oils to help keep engines cleaner than ever. It's all part of our lubrication knowledge, the greatest in the petroleum industry. And it's all yours—to help keep your production rolling.

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Rely on **SOCONY-VACUUM**
Correct Lubrication

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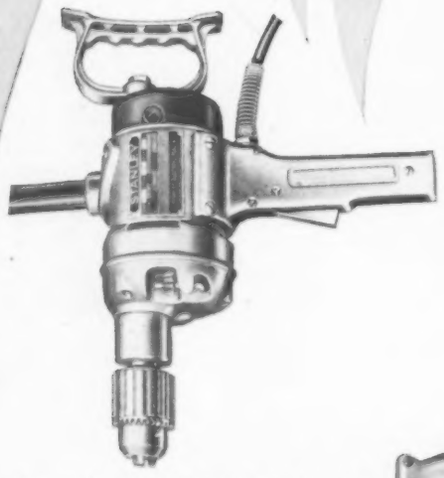
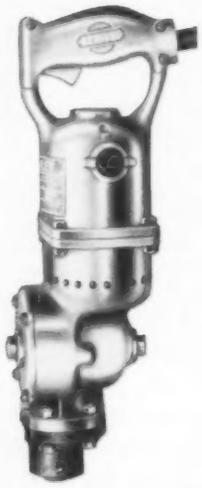
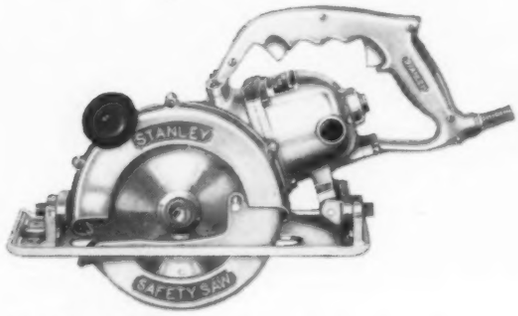
JOB-PROVED
electric tools



TINY 218 UNISHEAR . . . Cuts 18 gauge steel at speeds up to 15 feet a minute. Operator only has to guide it. Cuts right to the line . . . curves, angles or notches with hairline accuracy . . . inside or outside. Sturdy aluminum alloy housing, ball bearings, slide operated switch, duplex handle. Blades easily removed, resharpened and replaced.

No. 121 ELECTRIC DRILL—1/2" capacity . . . Lightweight production tool, ideal for millwrights and maintenance men.





No. W8 SAFETY SAW—0 to 2¾" capacity . . . Duplex handle, easy adjustment for depth and bevel cutting. Non-warping heat-treated aluminum base. Blade totally guarded.

No. 310A ELECTRIC HAMMER—1⅛" capacity . . . Drills, chips, channels, chisels, scales, vibrates . . . any work requiring hammer action.

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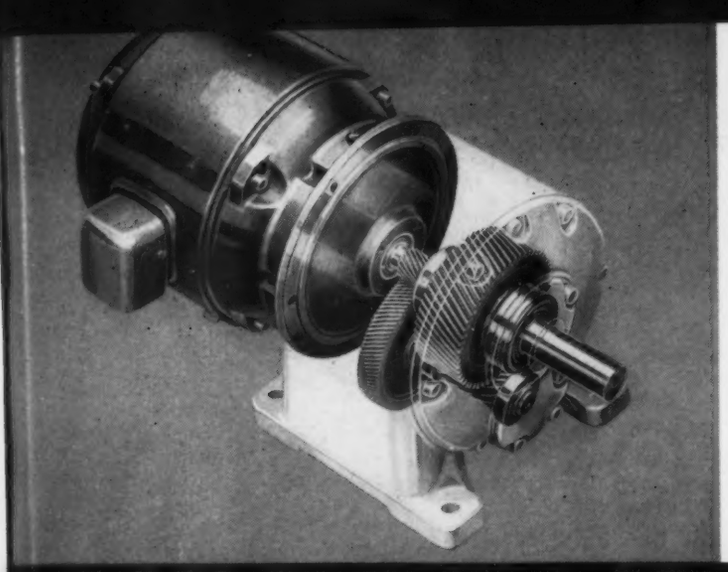
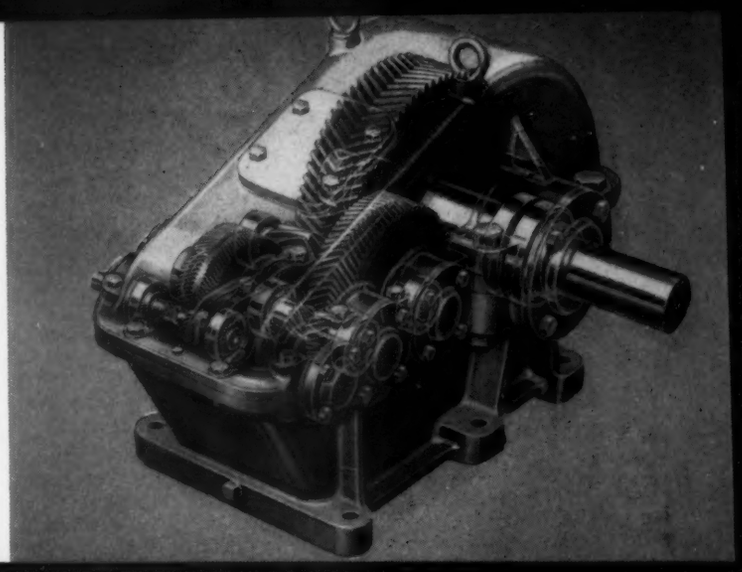
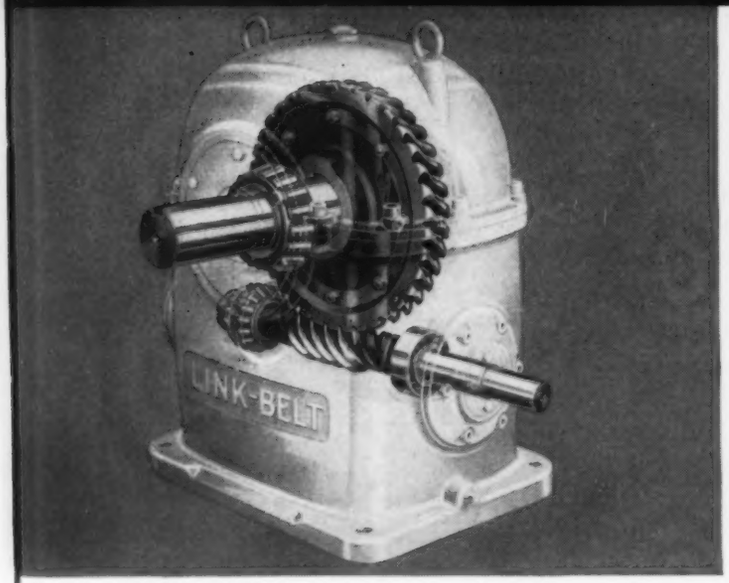
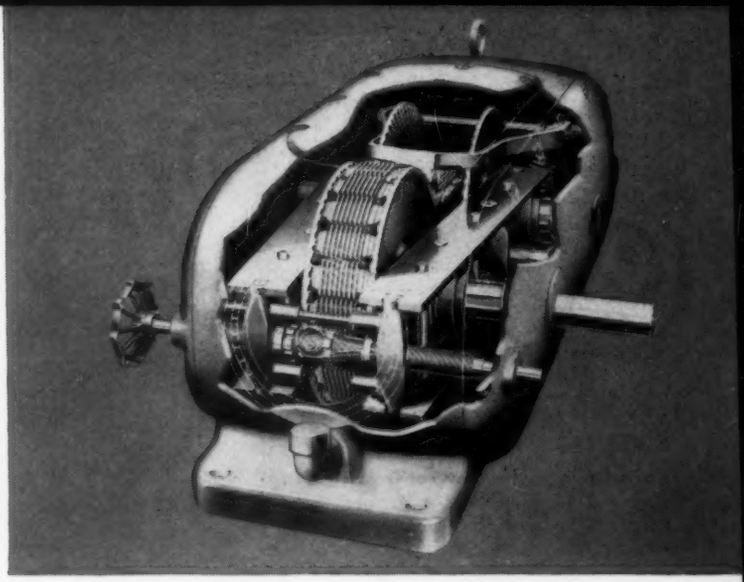




is Speed Reduction Your Problem?





Consult Link-Belt!

Power at the required speed is available through the use of a Link-Belt enclosed gear drive. Regardless of your specific needs for ratio, power or speed, we have the correct answer, and our engineers will be pleased to assist you with your power transmission problems.

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Packaged Power Drives that are compact, economical and highly efficient are available with ratings from 1 to 30 horsepower and output speeds from 280 to 6 R.P.M. These easily-installed streamlined Gearmotors are completely explained in Book No. 1815, a copy of which is yours for the asking.

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In any process where precise speed is a factor in quality, costs, efficiency or profits, the PIV Gear is the ideal answer to your problem. Built with vertical or horizontal housing, plain or motorized, and with or without enclosed reduction gears. From ½ to 25 h.p. and ratios up to 6:1. Send for Book No. 1874-B.

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For high reduction drive arrangements, these time-proved rugged drives are an ideal answer. Take your choice from a complete line of single, double or helical Worm Gear Drives having horizontal or vertical output shafts and satisfy exactly your requirements. We would be pleased to send Book No. 1824, which describes in detail our Worm Gear Drives.

Herringbone Gear Drives

Link-Belt's large selection of single, double and triple reduction Herringbone Gear Drives adequately fill the bill for small, moderate or large horsepower speed reduction requirements. A mighty good answer to your speed reduction problem. Can we send Book No. 1819 so you can see for yourself?

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LINK-BELT

Power Transmission Machinery

"THE COMPLETE LINE"

☐ **1. COLLAPSIBLE TUBES**—Catalog describes Sheffield Process tubes which are made for a wide variety of products from pure tin, Sheffaloy, lead, tin coated (lead base or core), and aluminum, and also Sinicote inner coated tubes which can be safely specified for many strongly acid or alkaline products, readily leakable oils, greases, and other commodities. New England Collapsible Tube Co.

☐ **2. SPRAY PAINTING**—The Dualheet paint and air heater is the subject of bulletin issued by the Beck Equipment Co. The heater is said to give precision control of both paint and air temperatures, and to make for lower finishing costs.

☐ **3. HOUDAILLE CONVEYOR**—Conveyor consists of neoprene or cast iron flights on endless chain pulled through a pipe casing by means of a high torque gear transmission. It will move any material which will settle to the bottom of a tank, hopper, bin or other form of reservoir. It is used in the metal-working field for moving chips, cast iron dust, aluminum oxide and abrasive sludge; and is adapted for carrying raw production materials such as ceramic powders, cement, aggregates; foundry sands and slag; pelleted materials, quench oil and coolants, sludge, scale, etc. Bulletin is available from Honan-Crane Corp.

☐ **4. MICROFILM EQUIPMENT**—Printed matter describes the Bell & Howell Company's Filmo microfilm equipment. With Filmo both front and back of documents are photographed simultaneously in one operation, or it can be used for one-sided photography (8mm). Recorders are capable of utilizing one-half the 16mm film width at a time, photographing up one side the film and down the other providing double the amount of pictures at one-half the cost. 22,000 check-size images can be recorded in every 100 ft. of 16 mm. film.

☐ **5. STORAGE RACKS**—Bulletin describes the Barrett storage rack systems for barrels and drums, and storing skids. Systems are said to have effected 200 to 600% expansion in storage facilities and 25 to 65% reduction in handling costs. Barrett-Cravens Co.

☐ **6. INDEXING MACHINES**—Bulletin describes Rotomatic vertical indexing machines for drilling, reaming, milling, boring, chamfering, back-chamfering, sawing, recessing and tapping operations. Machines are said to provide solution for many production problems, and to reduce costs through the elimination of a quantity of standard machine tools and their operators. Davis & Thompson Co.

☐ **7. GEAR-MOTOR**—Brochure #3-200 describes Type UW Gear-Motor, illustrates mountings and includes physical data and tabulation listing torques, speeds, gear ratios and overhung load capacity. Janette Mfg. Co.

☐ **8. ALLOY STEELS**—Stock List of Hy-Ten alloy steels, S.A.E. and A.I.S.I., is available from Wheelock, Lovejoy & Co.

☐ **9. CIRCUIT BREAKER OILS, Cleaning**—The Modern Way to Clean, Stabilize, Dehydrate and Degasify Transformer and Circuit Breaker Oils, is a four-page bulletin on the Bowser Hydro-Volifier. It improves oil dielectric to as high as 35 kv. Progressive acidity is stopped. Bowser, Inc.

☐ **10. COMPONENTS, Contract Service**—Brochure describes the facilities of the Connecticut Telephone & Electric Division of Great American Industries, Inc., for designing and producing all types of components, including die castings, press assemblies and metal fabrciation, stampings, complex assemblies, etc.

☐ **11. INDUSTRIAL RUBBER PRODUCTS**—Three-color catalog describes wide range of custom fabricated rubber products made by the Stalwart Rubber Co. Products are available in natural or reclaimed rubbers, and in Buna S, Neoprene, Buna N, Thiokol, and Silicone. Rubbers can have durometer hardness from 30 to 100; tensile strength from 500 to 3500 psi, and elongation of 50 to 900%. One section is devoted to the Silicones which have wide temperature range, good dielectric qualities, and are resistant to permanent compression, lubricating oils and some chemicals.

☐ **12. R. R. CAR DETHAWER**—Circular describes sheet metal trough-type railroad car de-icer which thaws out frozen coal quickly in steel railroad cars; simple in design; always ready for use. J. C. Corrigan Co., Inc.

☐ **13. ELECTRIC SPECIALTIES**—24-page catalog describes complete line of electric specialties of Allied Electric Products, Inc., and Sheldon Electric Co.—lamps, fluorescent starters, contacts, plug caps, etc., etc.

☐ **14. pH CONTROL**—pH and conductivity control and their application to various industrial processes feature new catalog #15-12 issued by the Brown Instrument Co. Examples presented include pH control in heavy chemical industries, electroplating, pulp and paper, research, food and steel industries, water treatment, power plants and the textile industry.

☐ **15. HYDRAULIC CYLINDERS**—Hydraulic cylinders for low pressure applications are the subject of new catalog issued by Hydro-Line Manufacturing Co.

☐ **16. SEPARATORS**—Steam, Oil, Air, Gas separators and exhaust heads are the subject of catalog 500 issued by Wright-Austin Co.

☐ **17. STEEL TUBING**—Stock list of steel tubing—seamless and welded, carbon, alloy and stainless, has been issued by the Korhumel, Heffron & Preiss Steel Co.

☐ **18. THERMOCOUPLES**—Complete new Thermocouple Manual entitled Bulletin T/C 7 has been released by the Wheelco Instruments Co. It gives information on selection, protecting tubes, methods of checking thermocouples and pyrometers and installation data, etc.

☐ **19. FOUNDRY EQUIPMENT**—Bulletin 124-B describes Floatex foundry shakeouts and other products for foundries. Floatex units are full-floating, using all of their energy to shake out the flask with none of the vibration escaping into the foundations. They can be adjusted to meet specific requirements whether for small units weighing a few pounds each or huge castings weighing 100 tons or more. They are easy on flasks and sand reinforcements. Robins Conveyors Divn., Hewitt-Robins Inc.

☐ **20. MIDGET RELAYS**—New catalog-bulletin issued by Struthers-Dunn, Inc., is designed to simplify the selection and use of midget relays for almost any application. It gives complete information on hundreds of midget industrial control relays with exact contact arrangement, etc. Underwriters approved relays with 15 amp (115V a-c) contacts are listed.

☐ **21. VENEER SAMPLES**—Free samples of Korina veneers made from a new African blend hardwood are being offered by William L. Marshall, Ltd. Brochure describes Korina as important new development.

☐ **22. SILICONE FLUIDS**—Booklet DC 200, Silicone Fluids, is said to be the most comprehensive body of information available on the properties and behavior of the DC 200 Silicone Fluids, notable for their heat stability and relatively constant viscosity over a wide temperature range. Booklet tells about their usefulness as damping and hydraulic media, as liquid dielectrics, as special purpose lubricants or as additives, impregnants or coatings. Dow Corning Corp.

☐ **23. DUPLICATOR**—Bulletins describe the Models 250 and 150 Niagara stencil duplicators, and speed-sheeter which interleaves 250 copies per minute. Operating attachment of speed-sheeter can be mounted on or removed from duplicator in three seconds. Niagara Duplicator Co.

☐ **24. STEAM GENERATION**—Bulletin describes the Cyclotherm Automatic Steam Generators which are said to set a new standard of fuel economy, and reduce maintenance 30% to 50%. Design is said to assure a guaranteed 80% efficiency when fired with oil, gas or with a combination burner for oil and gas. Cyclotherm Corp.

☐ **25. SWING LATHES**—Catalog No. 73 describes 13" and 14½" swing precision

(*Please turn to page* 14)

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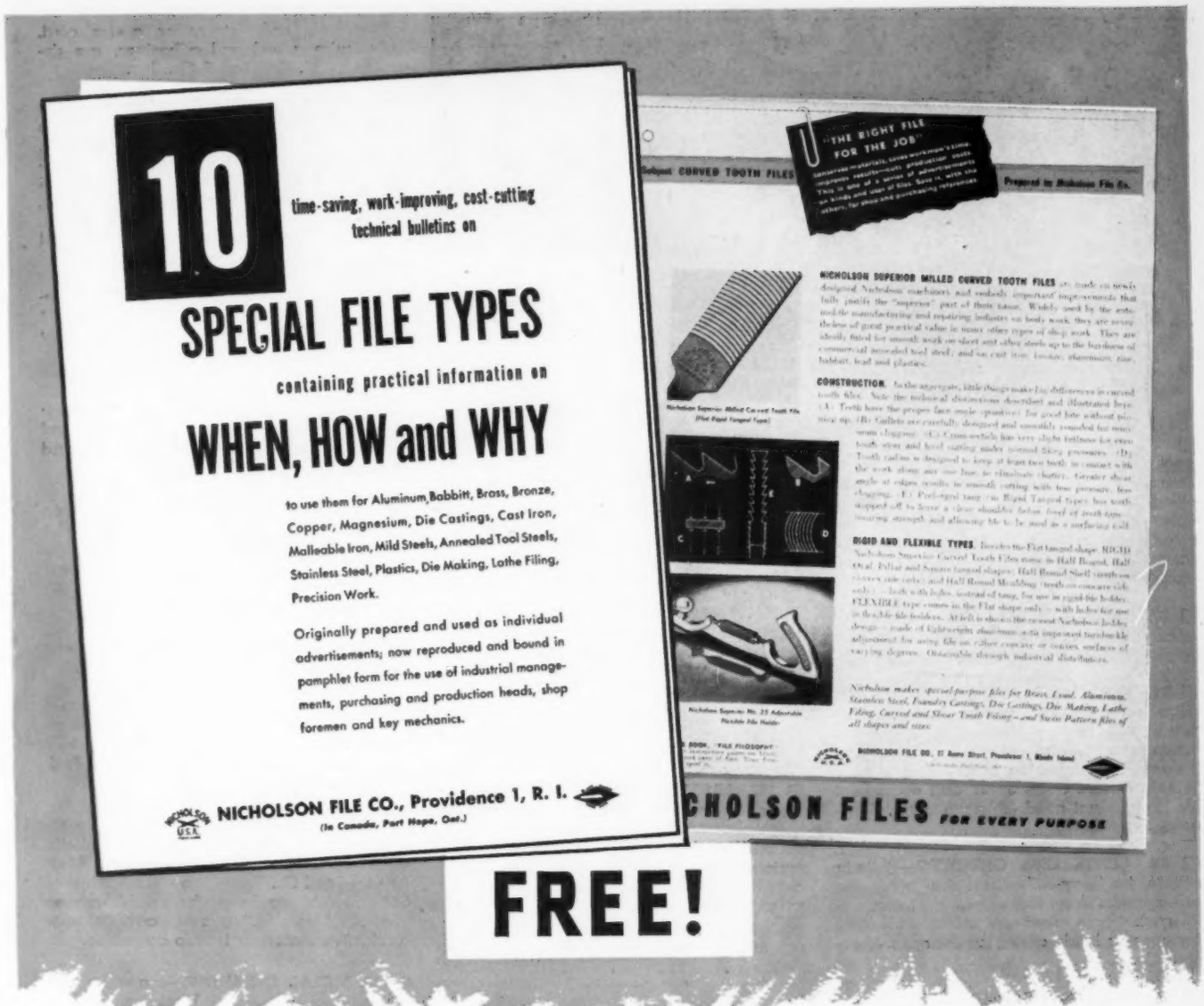
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(*Continued from page* 12)

lathes which feature a new headstock spindle with larger bore to take collets up to 1" maximum capacity. Also included are chucks, collets and other accessories. South Bend Lathe Works.

☐ **26. SNOW LOADER**—Brochure of 8 pages describes operations and features of new Model 522 snow loader. Use of machine is said to make for material truck time savings, and to provide practical means of drastically cutting snow removal costs. Machine can be converted into bucket loader.

☐ **27. SAFES, CHESTS**—Complete line of safes and money chests is described in new catalog offered by the Guardsman Safe Co.

☐ **28. INDUSTRIAL LUBRICATION**—A 48-page rotogravure catalog presents Alemite's full line of industrial lubrication equipment. Pictorialized presentation makes it easy for purchasing agents and buyers to select correct lubricants and equipment for every plant need. Alemite Divn., Stewart-Warner Corp.

☐ **29. CENTERLESS GRINDING**—Bulletin covers the "pay-off" wheel that gives the full benefits from centerless grinding. It tells what type of wheels are best adapted for specific kinds of work. Simonds Abrasive Co.

☐ **30. REMOVING TRAMP IRON**—Bulletin describes Perma Plate high intensity magnets styled the lightest, most powerful permanent alnico magnet available, for the removal of tramp iron from food, grain, liquids, plastics, chemicals, drugs, etc. Dings Magnetic Separator Co.

☐ **31. ROTARY UNION**—Bulletin 400 describes Rotary Union for stationary to rotating connections, which may be used on temperatures up to 600 deg. and pressures up to 150 lbs., for type S, providing inlet flow to rotating cylinders, and outlet of condensate; and type P providing one passage only. Manufactured in 8 pipe sizes 1.2" through 3". Protective Service Co.

☐ **32. BALL BEARINGS**—Cartridge ball bearings are the subject of 28-page illustrated booklet issued by the Norma-Hoffman Bearing Corp. Applications are described, along with load rating, and information on dirt protection, grease-type, and long service features without relubrication.

☐ **33. CONTOUR SAWING**—8-page catalog, "They Cover the Field" describes 13 high speed DoAll Zephyr band sawing machines which range from a "utility" model weighing 425 pounds with a 16" throat to a powerful precision model weighing 5,640 lbs. with a 60" throat. Listed are 62 representative materials that may be contour cut with these machines. The DoAll Co.

☐ **34. DRILLERS, TAPPERS**—Model C Holesteel Type B adjustable multi-spindle general purpose drillers and tappers are the subject of 20-page catalog issued by the National Automatic Tool Co. Catalog includes production case histories.

☐ **35. FORGINGS**—Comprehensive reference data booklet on forgings, 44 pages, has been published by the Steel Improvement & Forge Co. It details the various types and characteristics of forgings, illustrates grain flows, and wide variety of forgings. Purchasing men will find information on delivery service of interest.

☐ **36. BLASTING NOZZLES**—Catalog illustrates Super-Titan blasting nozzles with tungsten carbide liners and accessories. Bulletins contain tips on use of nozzles in various industries. Mills Alloys, Inc.

☐ **37. SOUND CONTROL**—Noise quieting, vibration isolation and acoustical correction are the subject of bulletin just released by the Johns-Manville Co., in which typical installations are illustrated. Bulletin also contains data on size, weight, and sound absorption of the materials recommended.

☐ **38. STAPLING, STITCHING, Fastening**—Time and Money-Saving case histories of stapling and wire stitching, feature booklet released by Bostitch, manufacturer of some 800 machines for stapling and wire stitching. Material and labor saving costs run as much as 75%.

☐ **39. SPEED REDUCER**—Bulletin describes Speedaire worm gear speed reducer which is a fan cooled unit claimed to save space, save weight and save money, and to give more horsepower per dollar. It contains case histories of typical installations. The Cleveland Worm and Gear Co.

☐ **40. UNIVERSAL TESTER**—Bulletin covers Dillon Model L tester, giving practical information on testers for any type of material from fabrics to metals used in industrial production. The Model L has seven different ranges, for testing materials of tensile strength from a few pounds up to 160,000 pounds psi. Photographs show construction for tensile, compression, transverse and shear testing; handling of flats and rounds, and fixtures for fabrics, cord, rope, wire, wood and adhesives, are described. W. C. Dillon & Co., Inc.

☐ **41. UNIT HEATER**—Unit Heater catalog issued by the Ilg Electric Ventilating Co. is a practical work-book on unit heaters. Pictures show application views, dimensions and ratings of the four different models of Ilg Unit heaters—the horizontal, low-ceiling, vertical and textile types. Capacities are listed for 2, 5, 10, 50 and 100 lbs. steam pressure.

☐ **42. VALVES**—Catalog section 12-H describes cast steel pressure-seal bonnet valves. These valves are of new flow design, in stop, non-return and check types, with chromium-molybdenum steel bodies and welding ends for services of 900, 1500 and 2500 lb. sp at 1200 deg. F. New method for correlation of valve size and pressure drop is also included. Edward Valves, Inc.

☐ **43. ALLOY STEEL CHAIN**—Booklet on the "Inspection, Care and Use of Taylor Made Alloy Steel Chain", is offered by the S. G. Taylor Chain Co. Maximum wear limits, safe-working load limits, and correct repair methods are also covered.

☐ **44. SHADED POLE MOTORS**—Bulletin describes Redmond single bearing, shaded pole a-c motors, tradenamed Monomotors, up to 9 watts output. Features are forced recirculation of lubricant for long, service-free operation, precision finished single bearing, and smooth, quiet operation. Redmond Co. Inc.

☐ **45. GAGES**—Magnetic Gages for continuous gaging, are the subject of bulletin issued by Pratt & Whitney, Division Niles-Bement-Pond Co. The "Magnetic" Schuster gage which regularly checks thicknesses from .005" to .060" of non-magnetic, non-conductive materials is also described.

☐ **46. METAL CLEANING**—Materials and Methods for the Metal Workings Plant—that is the subject of booklet issued by Turco Products. Contents deal with iron and steel cleaning, aluminum and aluminum alloy processing and cleaning, and cleaning of other non-ferrous metals, paint removal, etc.

☐ **47. PUNCHING, SHEARING, Etc.**—Bulletin No. 51-48 covers new line of hydraulic punching units with cylinders interchangeable on different types of bases, which may be used for punching, shearing, notching, trimming or forming. Progressive Welder Co.

☐ **48. MATERIALS HANDLING**—The Floor-Veyor, interfloor escalator type power belt conveyor is covered by bulletin issued by the Rapids-Standard Co. It finds application wherever large quantities of merchandise must be moved from floor to floor. Savings up to 60% in time and manpower are reported.

☐ **49. AIR CYLINDERS**—Catalog section 53 illustrates and describes the Geroter May Corporation's line of air cylinders. Drawings and tables are furnished for each model and size cylinder showing complete detailed dimensions. Mountings include rabbett, foot, trunnion, center line, blind end flange, rod end flange and clevis. Types and model valves are recommended for various applications.

(*Please turn to page* 16)

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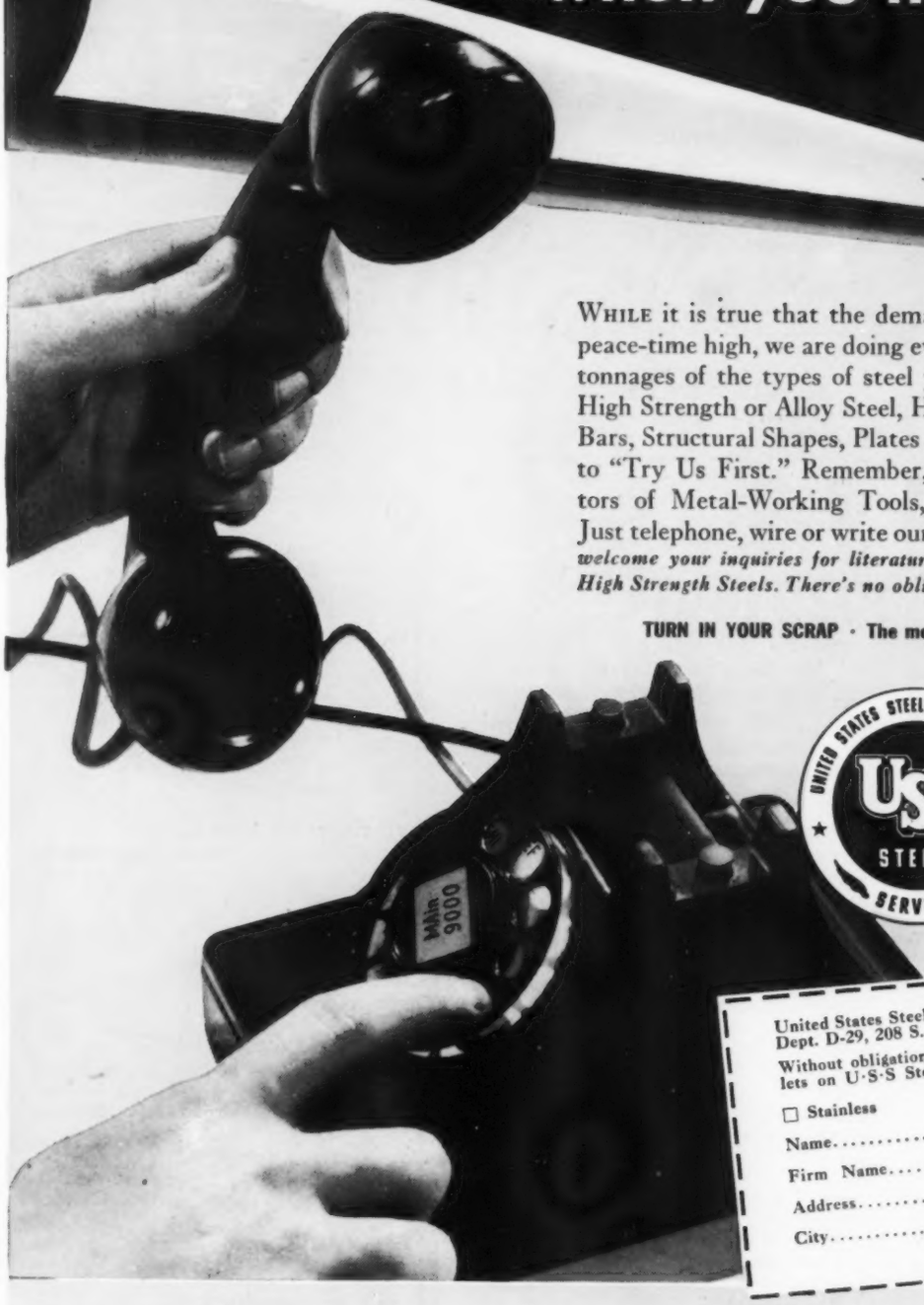
TRY US FIRST

—when you need steel



WHILE it is true that the demand for steel has reached a peace-time high, we are doing everything possible to obtain tonnages of the types of steel you need. So, for Stainless, High Strength or Alloy Steel, Hot Rolled or Cold Finished Bars, Structural Shapes, Plates and Sheets, your best bet is to "Try Us First." Remember, too, that we are distributors of Metal-Working Tools, Supplies and Machinery. Just telephone, wire or write our warehouse nearest you. *We welcome your inquiries for literature covering Stainless, Alloy and High Strength Steels. There's no obligation.*

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USS

UNITED STATES STEEL

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(*Continued from page* 14)

☐ **50. BOILER FEED PUMPS**—Centrifugal boiler feed pumps, type WC—high pressure—high temperature, are the subject of Bulletin W-319-Bic released by Worthington Pump and Machinery Corporation.

☐ **51. CONCRETE FLOORS**—"Lumnite Concrete Floors" is the title of booklet on Corrosion-Resistant and Heat Resistant floors just published by the Universal Atlas Cement Co. The basic information adequately covers both the methods and the materials used in placing corrosion-resistant concrete in variety of industrial applications.

☐ **52. PORTABLE SPOT WELDER**—New Underwriter Laboratories approved portable spot welder that is fast, versatile and easy to operate, is described in bulletin issued by Adams Portable Spotwelder. Transformer is rated at 112 amp, and the carrier case, equipped with fool-proof connections and carrying handle, is mounted on casters. Two types of guns available. Pistol type furnishes adjustable pressure at welding points, and shape of jaws may be changed to accommodate the unusual jobs. Push type gun permits the spot welding of large surfaces that cannot be reached by the pistol type. For continuous type of assembly operation a hydraulically operated foot treadle is available.

☐ **53. HEAT TREATING**—Catalog TB2-621, 32 pages, covers the Vapocarb-Hump triple-control method for the heat treatment of steel. Method is said to make for definite savings, no rejects, little or no refinishing, and no distortion. Equipment is simple, flexible, compact, and applicable also to carburizing and gas cyaniding. Leeds & Northrup Co.

☐ **54. ELECTRIC MOTORS**—Bulletin MB-1 describes electric motors; multispeed gear-shift drives, pedestal grinders and polishing and buffing lathes. Lima Electric Motor Co.

☐ **55. STEAM LINE Cleaning**—Bulletin describes the Pressure-Jet system for clean steam heating and processing plants. System is automatic and will treat a steam system continuously over a long period of time. Pressure-Jet Systems Inc.

☐ **56. DRILLS, REAMERS, CARBIDE Tools**—225 page catalog has been issued by Chicago Latrobe, designers and makers of carbon, high speed & tungsten carbide twist drills, reamers and special tools. It is in convenient shelf size, 6" x 8½", with plastic laminated cover. It has alphabetical and numerical indexes.

☐ **57. BELT CONVEYORS**—Stationary medium duty horizontal and incline belt conveyors are the subject of Bulletin PB 60-1A-1 issued by the Island Equipment Corporation. Illustrations show various types in use, including floor-to-floor units.

☐ **58. PUMP**—Bulletin 103 describes the Monobilt pump, pump and motor being combined in one compact unit. Roy E. Roth Co.

☐ **59. PACKAGE STITCHERS**—Saving money with Silver Stitchers is the subject of Bulletin issued by the Stitching Wire Divn. of the Acme Steel Co. Machines are built for all standard sizes of wire. Stitches are formed, driven and clinched from continuous wire coils in all types of solid fibre and corrugated shipping cartons.

☐ **60. PLASTICS**—Colorful bulletin tells about Catalin thermosetting cast phenolics, "Loalin" polystyrene thermoplastic molding compounds, and variety of thermosetting and thermoplastic liquid resin formulations employed in coating, gluing, bonding, and impregnating. Catalin Corporation of America.

☐ **61. ADHESIVES**—Revised catalog section on adhesives has been issued by The B. F. Goodrich Co., describing the range of the company's adhesives and their applications, giving classifications of types of rubber cements and service requirements and lists the different products.

☐ **62. SPEED REDUCERS**—Booklet of 24 pages describes the Cullman Wheel Company's line of speed reducers; and presents 30 working drawings of practically every type of single and double reduction type speed reducers, press drives for motors ranging from ¼ to 15 hp.

☐ **63. PLATEN PRESSES**—Bulletin 286, 12 pages, carries 21 photographs of standard and custom built steam platen presses for use in the fabricating of belting, brake lining, druggists' sundries, gaskets, packing, grinding wheels, insulating board, linoleum, molded rubber goods, plastic laminates, etc. Baldwin Locomotive Works.

☐ **64. COOLANT PUMPS**—Coolant and Circulating Pumps are the subject of Bulletin 52B6975 issued by Allis-Chalmers Mfg. Co. Construction details and application information of foot mounted, submerged and side-wall mounted pumps are given.

☐ **65. FUEL OIL Additive**—Industrial fuel oil additive that removes sludge from fuel oil systems, how it works and how and where to use it, are subject of pamphlet issued by E. F. Houghton & Co. Name of product is Houghto-Solv.

☐ **66. PACKAGING TAPE**—"Zip—And It's Open" is subject of folder telling about Zip-Tape for use in packaging civilian products such as bread, gum, pharmaceuticals, razor blades, etc. The Dobeckmun Co.

☐ **67. BUILDING MAINTENANCE**—More than 200 building maintenance and construction materials are illustrated in new 72-page Handbook of Information issued by Truscon Laboratories. This pocket-size booklet is cross-referenced by product name and general material classification.

☐ **68. METAL CLEANING**—Printed matter describes the Wheelabrating method and equipment for economical removal of scale from heat treated and forged parts. System is said to make for faster and better cleaning, to save labor, space and equipment, and to make for easier inspection and fabrication. American Wheelabrator & Equipment Corp.

☐ **69. CHEMICAL PUMPS**—Bulletin 484 describes pumps which are recommended for pumping in precisely controlled volumes, in small quantities and at high pressures for hydrostatic testing and other high pressure services. They pump solids in suspension, tars, asphalts, etc., as well as high oils and solvents, hot or cold. Milton Roy Company.

☐ **70. FAN-MOTOR Installation**—New twin rail base described in Catalog TR-801 issued by the Korfund Co. is said to offer complete adjustability and rigidity. Base is known as the "Duplex". It enables selection of drive-center distance, motor position, fan rotation and hold-down bolt location on the job-site.

☐ **71. PORTABLE TOOLS**—Booklet No. 31 explains how high cycle portable tools meet the needs of portable tool users with particular reference to reducing costs by increasing production per man per tool. It is claimed that Rotor high cycle tools will increase the work done by portable tools in the average plant by 30 to 40%. The Rotor Tool Co.

☐ **72. TRIMMING DIES**—Brehm trimming dies for flat edge trimming and notching of drawn shells are the subject of bulletin issued by The Steel Products Engineering Co.

☐ **73. GAGES**—Indicating gages, dial indicators, dial comparators, fixed limit gages and adjustable limit gages are the subject of condensed Catalog A issued by the Standard Gage Co., Inc.

☐ **74. JIG GRINDING**—The B & T jig grinder is the subject of bulletin issued by Boneham & Turner, Ltd. It makes possible correcting bores for size and location in hardened components. Bores can often be located and ground in an average of 15 minutes each compared with an average of 2 to 3 hours each with old methods, depending upon the type of work. Extreme care enables bores to be spaced to within approximately .0005". Using the Jig Grinder, location can easily be held to .0002" or even closer depending upon the machine used.

(*Please turn to page* 19)

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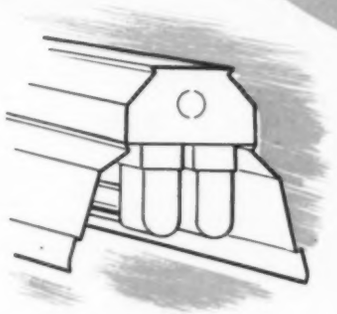
NOW!

Rounding out the line of

Wheeler

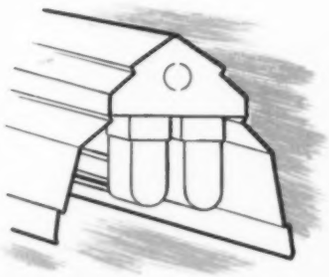
"SKILLED LIGHTING"

...New SLIMLINE Fluorescent Fixtures



INDUSTRIAL UNITS

End view of industrial type unit showing flat top. These units are designed for general industrial use under normal atmospheric conditions.



TEXTILE UNITS

End view of textile mill unit showing peaked top especially designed to eliminate frequent cleanings and to offer outstanding protection against humidity.

THIS SMART-LOOKING SLIMLINE fixture offers you more than just sleek beauty . . . it also offers a genuine "Skilled Lighting" unit for use with the new high efficiency SLIMLINE Lamps. Assures extra long service life with minimum maintenance.

Typical of Wheeler engineering thoroughness is the exclusive auxiliary lamp support at center of the fixture to prevent vibration of the 8 foot lamps. Fixture channel is in one piece . . . available in either baked enamel or Wheeler triple-guarded *vitreous porcelain enamel* finish. Reflectors are furnished in vitreous porcelain enamel finish only.

TWO TYPES: INDUSTRIAL-TEXTILE

The new Wheeler SLIMLINE is made for regular industrial application or for textile mill application. Textile mill units have peaked channels to prevent accumulation of fly, lint, dust and moisture.

HIGHEST EFFICIENCY

SLIMLINE lamps operate at the highest efficiency of any lamps. They start instantly . . . no special ballasts needed. If increased intensity is desired, 300 MA ballast is available to replace 200 MA ballast using same lamps.

EASIEST TO HANDLE

SLIMLINE fixtures have only 2 sockets . . . lamps have only 1 terminal pin in each end. Only two 8 foot lamps for a double-length fixture. Get all the facts on the extra value of these new SLIMLINE Units. Write to **Wheeler Reflector Company, 275 Congress St., Boston 10, Massachusetts.**

Distributed Exclusively Through Electrical Wholesalers

Wheeler REFLECTORS

SKILLED LIGHTING

MADE BY SPECIALISTS IN LIGHTING EQUIPMENT SINCE 1881

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The right material for your job
. . . right at your fingertips!

How to Save Production Hours and Dollars on Your Electrical Insulating Jobs . . .

One of the surest ways to reduce unit costs on any job is to be right the first time when selecting materials. Continental-Diamond's complete line of high strength electrical insulating materials makes proper product engineering easy.

There are trained C-D technicians on hand at all times to give you personal help in getting better, lower-cost applications. To be sure of being right the first time in the selection of materials, call your nearest C-D office whenever the need arises.

C-D HIGH-STRENGTH PLASTICS

DIAMOND FIBRE—Vulcanized Fibre.
VULCOID—Resin Impregnated Fibre.
DILECTO—Laminated Thermosetting Plastic.
CELORON—Molded High-Strength Plastic.
MICABOND—Bonded Mica Splittings.

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Continental-Diamond FIBRE COMPANY

Established 1895 . . Manufacturers of Laminated Plastics since 1911—NEWARK 41 • DELAWARE

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CITY ..... ZONE..... STATE.....

PARTIAL LIST OF LITERATURE OFFERED BY ADVERTISERS IN THIS ISSUE

● Among the numerous catalogs, bulletins, and descriptive literature of value to Purchasing Agents in maintaining their product and source files are the following which are offered by advertisers in this issue.

(*See advertisers' index, page* 362)

SOCKET SETS—Catalog details lightweight sets designed for maximum efficiency with minimum of pieces. The Billings & Spencer Co.

BENCH GRINDER—6" standard bench grinders for spotting within reach of workers for faster tool grinding and other jobs. Van Dorn Electric Tool Co.

ABRASIVES—Data book describes complete line of grinding wheels in every combination of grain, grade and size. Simons Abrasive Company.

VALVES—300-page catalog No. 17M describes valves of all types. Darling Valve & Mfg. Co.

PERMANENT MAGNETS—Bulletin CDM-16 covers permanent magnet sub-assemblies, and CDM-2A is a permanent magnet catalog. Chemical Dept., Sec. 1F, G. E. Company.

MATERIALS HANDLING—"Industrial Logistics" is subject of booklet on scientific materials handling published by Elwell-Parker Electric Co.

TRANSFORMERS—Bulletin TU-56 details transformers, enclosures, incoming line sections, optional equipment and accessories, and TU-181 covers Power Transformers. Wagner Electric Co.

ROPE SIZES & STRENGTHS—Chart gives detailed specs. for 3-strand rope with standard lay, 9/16" to 12" circumference. Plymouth Cordage Co.

LABORATORY MACHINES—Catalog describes mills, crushers, rolls and sample grinders which have all the features of full-size machines. Sturtevant Mill Co.

STEELS—Booklets describe stainless, alloy and high strength steels. United States Steel Supply Company.

FILING CABINETS—Brochure LB 356 gives full information on "Aristocrat" filing cabinets in Gray-Rite enamel finish for beauty and better lighting. Remington Rand.

HEATING EFFICIENCY—Fact-filled booklet entitled "Combustion Control for Industry", on getting maximum efficiency from heating units is available from Cities Service Oil Company.

TAPS—444 page Small Tool Catalog contains complete listings of Pratt & Whitney taps.

POWER TRANSMISSION—Bulletins 1815, 1874-B, 1824 and 1819 describe gearmotors, speed changers, worm gear drives and herringbone gear drives. Link-Belt Co.

PEELABLE SHIMS—Chart shows 46 time-saving applications of Laminum shims—laminated shim brass or steel built into a "solid" structure. Laminated Shim Co. Inc.

CLOTH BELTS—Booklet "Production Talks Backstands" gives series of case histories revealing savings with Metalite cloth belts for backstand operations. Behr-Manning.

METAL CONVEYOR Belts—Illustrated catalog shows types and advantages of numerous conveyor belt constructions. Wickwire Spencer Steel Division.

STAINLESS STEEL Tubing—TDC 122 gives composition of large number of grades of steel tubing in different analyses. Babcock & Wilcox Tube Co.

These, or any other bulletins, catalogs, etc., offered on the advertising pages of this issue, may be requested through PURCHASING's Reader Service. Simply indicate the page number of the advertisement and the company or product on the Reader Service card below.

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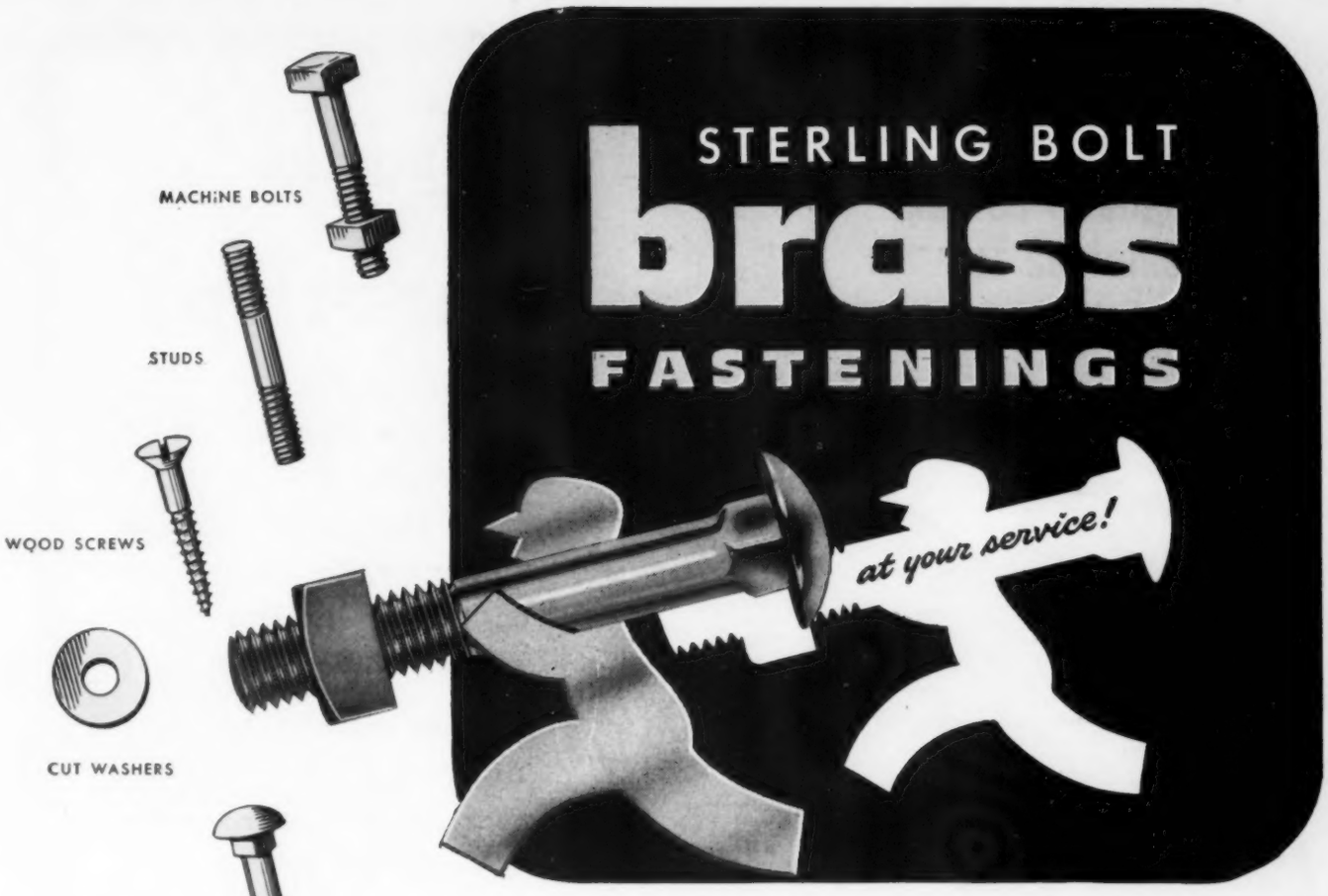

The Sterling Bolt Man is rarin' to go, eager and able to supply you with standard or special metal fastenings—IN PACKAGE OR BULK QUANTITIES, IN BRASS AND STEEL, INCLUDING STAINLESS. Sterling Bolt offers you dependable *single-source service* for all your metal fastening requirements—service that simplifies your purchasing problems and *saves you time and money.* Place your metal fastening orders with us for prompt, personalized attention—for delivery of the right fastener at the right time.

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Send for your FREE catalog TODAY

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Packed with valuable engineering and technical information.
Two hundred thousand items.
One hundred twenty-four pages.
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Please send me without obligation your new easy-to-use catalog.

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Bur-r-rlap?

Weel, it's wise and thrifty to deal with folks who *really know* bur-r-rlap*. . . folks you know you can depend on. So for whatever grade you need... *look to Bemis!*

Another important point... There's a Bemis plant very near you for better service wherever you are.

*Bemis' grading of Indian burlap is the recognized standard for the entire burlap industry. This acceptance as the "supreme court" of the industry comes from Bemis' long and unequalled experience as importer, converter and distributor of burlap.

BEMIS TITE-FIT TUBING saves time and money for those who use burlap for packaging odd-shaped and bulky products. This versatile tubing stretches in both directions for a neat, close-fitting cover.

World's largest importer of Burlap

BEMIS

General Offices—St. Louis

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ANNOUNCING

THE NEW YALE LOAD KING SCALES

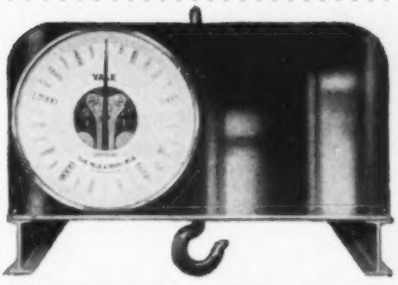
new type mechanism insures a longer life of sustained accuracy

Yale Load King Dormant Platform Scale available with or without tare beams or unit weight cabinet. Gross weighing capacity 12,500 lbs.

Yale Load King Portable Platform Scale. Can be furnished with 4 wheels or 3 wheels and a handle. Dial mechanism and platform lever system are unaffected by travel over rough floors. Gross weighing capacity to 2,250 lbs.

Yale Load King Counting Scales. Single or double fixed ratio models. Can be used for weighing and counting all kinds of parts quickly, accurately. Gross weighing capacity to 12,-500 lbs.

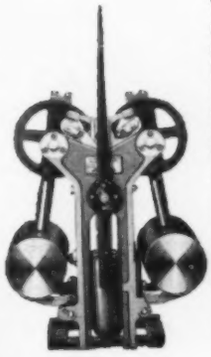
Yale Load King Bench Scales. Available either with or without tare and capacity beams. Several platform sizes. Gross weighing capacities up to 2,250 lbs.



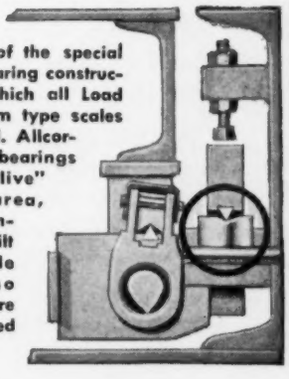
Yale Load King Crane Scale. Permits weighing while loads are in suspension; attach to hoist or crane. Standard and low headroom models. Gross capacities to 60,000 lbs.

Yale Load King Overhead Track Scales. Standard or low headroom lever systems. Available for use with existing or planned overhead track facilities. Gross weighing capacity up to 4,500 lbs.

Yale Load King Batching Scales. Feature high gross weighing capacity and assure consistently accurate batching of hot asphalt, concrete and other loose materials, liquids. Gross capacities to suit requirements.



The new Yale Scale mechanism with exclusive Magnetrol feature that controls weighing accuracy. Other features include fixed center construction that prevents misalignment of parts, positive mechanism locking device that protects parts against damage, and draft bands of a new alloy metal that will not rust, corrode, kink or break.



A close-up of the special outboard bearing construction with which all Load King Platform type scales are equipped. All corner support bearings are outside "live" platform area, making it impossible to tilt a Yale Scale platform no matter where load is placed on it.

YALE

SEND TODAY FOR BROCHURES, MENTIONING TYPE OF SCALE IN WHICH YOU ARE INTERESTED.

THE YALE & TOWNE MANUFACTURING CO.

ROOSEVELT BOULEVARD, PHILADELPHIA 15, PA.

Want Additional Product Information? See Page 19.

Spongex takes weariness out of work

For men at machines as well as at desks, for the housewife as well as for women in industry or the professions, *Spongex** sponge rubber reduces shock, vibration, noise and other discomforts . . . takes weariness out of work.

All the cushioning, sound deadening, sealing, insulating properties of rubber have been multiplied in *Spongex* and precisely engineered to a specific job. Whether a simple seat cushion or the life-critical gasket of an iron lung, a bassinet pad for a newborn baby or the window sealing in a stratosphere-flying plane. Everywhere and, seemingly, in almost every product . . . for refrigerator doors, shoe innersoles, typewriter pads, motor mountings . . . *Spongex* is helping product designers make living easier, quieter, more abundant for everyone.

Spongex does a better job because it's made by a company that for 25 years has concentrated exclusively on making rubber do a better job of cushioning, insulating, sealing. You can see the difference, feel the difference, prove the difference such experience makes. You can have generous samples of *Spongex* to experiment with and test for resiliency, cell structure, tensile strength and resistance to temperature extremes, moisture, acids, corrosive vapors, abrasion and aging. Write today, naming your product and problem. Sponge Rubber Products Co., Derby 132 Place, Shelton, Conn. Sales offices in principal industrial centers.

*Trade Mark Reg. U.S. Pat. Off.

SRP

SPONGE RUBBER PRODUCTS CO.

SPONGEX • CELL-TITE • TEXFOAM • TEXLITE • TEXLOCK

Want Additional Product Information? See Page 19.

X MARKS THE SPOTS

where these handy BENCH GRINDERS SAVE YOU TIME AND MONEY!

It's a smart plant layout that spots Van Dorn 6" Standard Bench Grinders within easy reach of workers . . . for faster tool sharpening that helps machine tools operate at peak efficiency! With plenty of Bench Grinders available, your workers won't have to waste time making long trips from their machines to the grinder and waiting in line to use it . . . won't put off sharpening tools because of the inconvenience!

These sturdy, well-balanced Bench Grinders also do many types of grinding and metal removing; polish and buff plated surfaces; remove rust and clean parts. They're economical to buy and economical to operate; packed with *plus-value* features: well-built constant speed 1/4 H.P. motors; easily adjusted tool rests; full-sized bearings on rotor and wheel spindles, covered by protective sleeves. Ask your nearby Van Dorn Distributor for a demonstration. Write for free catalog to: The Van Dorn Electric Tool Co., 764 Joppa Road, Towson 4, Md.

For Power Specify

"Van Dorn"

(DIV. OF BLACK & DECKER MFG. CO.)

PORTABLE ELECTRIC TOOLS

VAN DORN
6" STANDARD
Bench Grinder

ONLY $38.00

A price that makes it easy to buy several!

Want Additional Product Information? See Page 19.

B&W can supply you...

SEAMLESS or WELDED

Stainless Steel Tubing

in

different analyses

...for your corrosive and high temperature services. Write for TDC 122 which contains the composition of all these grades.

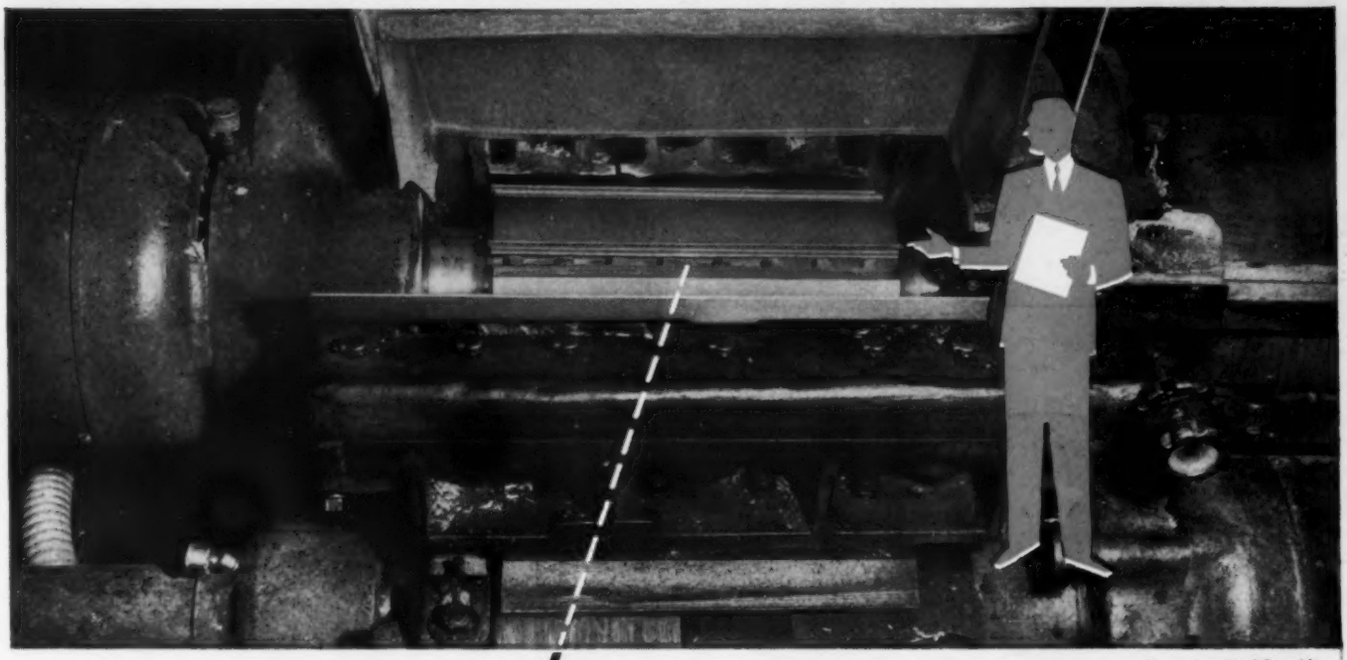
THE BABCOCK & WILCOX TUBE COMPANY
General Offices: Beaver Falls, Pa.
Plants: Beaver Falls, Pa. and Alliance, Ohio

BABCOCK & WILCOX SEAMLESS & WELDED TUBES

Seamless and Welded Tubular Products in a full range of Carbon, Alloy, and Stainless Steels for All Pressure and Mechanical Applications.

Want Additional Product Information? See Page 19.

A CASE HISTORY FROM THE NOTEBOOK OF A DISSTONEER



Planer in mill of Spaulding Lumber Company, Keysville, Va., equipped with Dissteel Thin Knives

DISSTEEL THIN PLANER KNIFE
Meets requirements of 75% of all types of planing

The Dissteel Thin Planer Knife takes abrasive woods in its stride

Knife replacements cut in half ...production boosted... with the help of a DISSTONEER

He may be able to do as much for you

The Spaulding Lumber Company, Keysville, Virginia, cut various kinds of hard wood for hogsheads, staves, shooks and building lumber. It's a tough job for any planer knife. With the blades they had been using, sharpening and jointing required a 10-minute down time every two hours. Also, the knives warped during grinding. Replacement was necessary after each 8-hour shift.

The Disstoneer recommended Dissteel Thin Planer Knives. They did twice as much work between sharpenings. Blade life was twice as long. Down time was cut in half. Costs were reduced and production greatly increased. The company was enthusiastic over the results.

An official of the company said, "I have used various knives over a 25-year period. None can compare with Disston Dissteel thin knives. They hold their edge longer . . . require less sharpening and jointing . . . do not warp while being ground."

WHEN YOU BUY A DISSTON PRODUCT YOU

BUY *DISSTON* STEEL SKILL and SERVICE

Let the Disstoneer help you with your cutting tool problems. His services are available without charge or obligation.

Write for further particulars or get in touch with your local Disston Industrial Distributor.

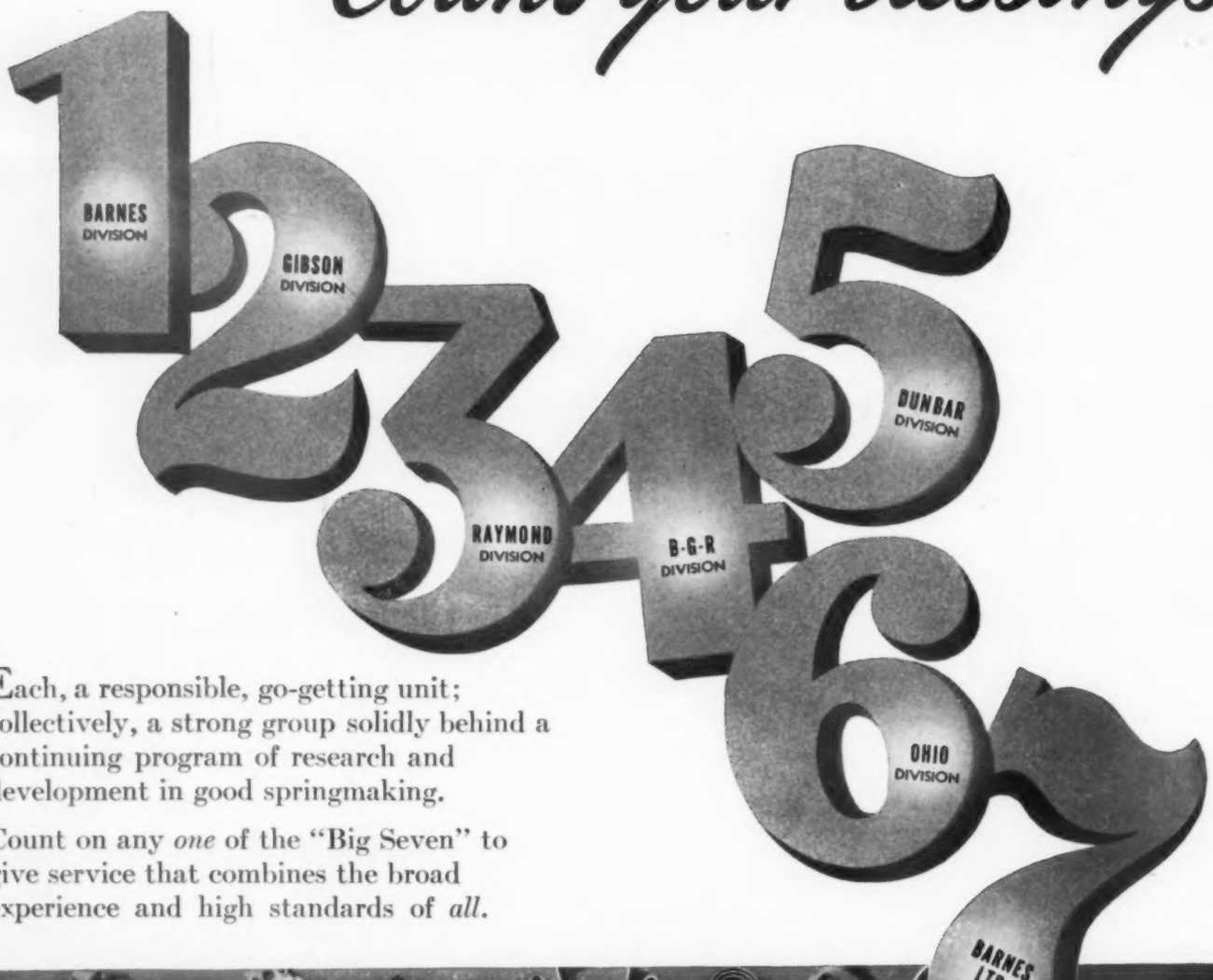
HENRY DISSTON & SONS, INC., 233 Tacony, Philadelphia 35, Pa., U.S.A.

Canadian Factory: **Toronto 1, Ont.**

Want Additional Product Information? See Page 19.

NEED SPRINGS?

Count your blessings



Each, a responsible, go-getting unit; collectively, a strong group solidly behind a continuing program of research and development in good springmaking.

Count on any *one* of the "Big Seven" to give service that combines the broad experience and high standards of *all*.

ORIGINAL DIVISIONS OF ASSOCIATED SPRING CORPORATION

WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT

THE WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE. CHICAGO 14,

RAYMOND Manufacturing COMPANY
CORRY, PENNSYLVANIA

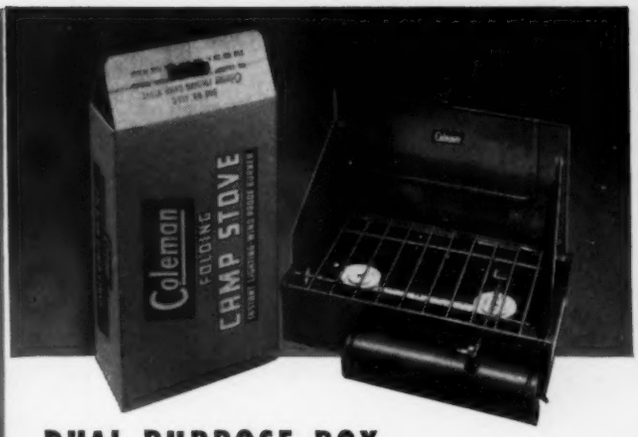
BARNES-GIBSON-RAYMOND
6400 MILLER AVE. DETROIT 11, and ANN ARBOR, MICH.

. . . . AND DUNBAR BROTHERS COMPANY DIVISION, BRISTOL, CONN.
OHIO DIVISION, 1712 EAST FIRST STREET, DAYTON, OHIO
IN CANADA, THE WALLACE BARNES CO., LTD., HAMILTON, ONT.

Want Additional Product Information? See Page 19.

GOLF CLUBS
"Merchandised" in
H & D
Shipping Boxes

"We now pack three sets of clubs in the time formerly required for one," says a prominent golf club manufacturer. "This box not only makes an outstanding display, it also helps boost sales," says the golf professional who handles the merchandise. Compact, sturdy, easily assembled, attractively designed, this H & D box is engineered to save money for the manufacturer, to make money for his dealers. It scores high on both counts.



DUAL-PURPOSE BOX
Increases Product Utility

One might think of a camp stove as an unwieldy piece of equipment — but not this one. It folds up neatly and compactly in a sturdy H & D box, designed especially to withstand the rigors of camp life. Box and stove take up little space in the camper's car; snug fit prevents rattle; convenient handle makes it easy to carry. This H & D packaging idea — of increasing the value of a product by making it easier to use — is virtually without limit in application possibilities.

Add Sales Punch WITH GOOD PACKAGING!

THIS SHELF PACKAGE
Simplifies the Retailer's Job

The "Eskimo" kitchen mechanic, a modern idea in electrical appliances, takes full advantage of Prepak* — a new idea in packaging. No packing or wrapping at point-of-sale is required. Attractively printed on sand color linen background, the "Eskimo" package invites "take with" purchases, another saving for the dealer. In the home, the box provides safe storage and protection for the life of the mixer.

*REG. U. S. PAT. OFF.

H&D

BOXES

FOR MORE INFORMATION, WRITE

HINDE & DAUCH

Authority on Packaging

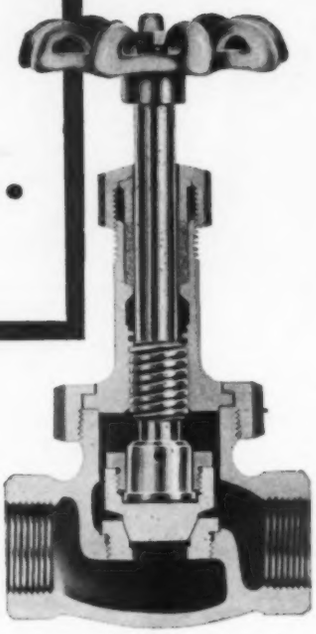
Executive Offices: 4902 Decatur St., Sandusky, Ohio

FACTORIES IN:

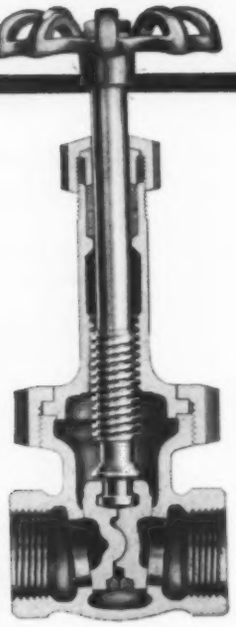
Baltimore 13, Md. • Buffalo 6, N. Y. • Chatham, Ontario
Chicago 32, Illinois • Cleveland 2, Ohio • Detroit 27, Mich. • Gloucester, N. J. • Hoboken, N. J. • Kansas City 19, Kansas • Lenoir, N. C. • Montreal, Quebec
Richmond 12, Va. • St. Louis 15, Mo. • Sandusky, Ohio
Toronto, Ontario • Watertown, Mass.

Want Additional Product Information? See Page 19.

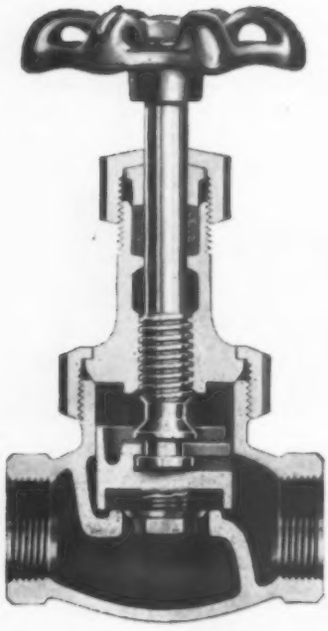
Walworth bronze valves...



Walworth No. 225P Globe Valve
500 Brinell Seat and Disc



Walworth
No. 29 Gate Valve



Walworth No. 95 Globe Valve
Re-New-Disc

built to give dependable trouble-free service on all recommended jobs

Walworth No. 95 Bronze Globe Valves (Angle Type: No. 96) are recommended for service where throttling is not required. They are rated at 150 psi working steam pressure, 500F; 300 psi cold water, oil or gas. The improved renewable disc and lock-on, slip-off disc holder — an original Walworth development—saves time and trouble. This valve can be repacked under pressure when fully opened. All parts are designed to give maximum service and strength.

Walworth No. 29 Bronze Gate Valves are rated at 200 psi working steam pressure, 550F; 400 psi cold water, oil and gas. These valves have rising stems and integral seats. Sizes 2-inch and smaller have union bonnets; sizes 2½ and 3-inch have bolted bonnets. Valves up to and including ¾-inch have solid wedge discs; 1-inch and larger have split wedge discs. These valves can be repacked under pressure when fully opened.

Walworth No. 225P Bronze Globe Valves (Angle Type: No. 227P) are rated at 350 psi working steam pressure, 550F; and 1000 psi non-shock service on cold water, oil and gas. The stainless steel, plug type seat and disc — heat treated to 500 Brinell — can be closed on sand, slag, scale and similar floatage, without injury to the seating surfaces. They are the longest wearing, TOUGHEST bronze valves you can buy.

For full information about Walworth Quality Bronze Valves, see your Walworth distributor, or write:

WALWORTH
valves and fittings
60 EAST 42nd STREET NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

Want Additional Product Information? See Page 19.

YOU GET QUALITY PLUS ENGINEERING SERVICE WITH G-E PERMANENT MAGNETS

The magnet shown is 10 times actual scale and is the heart of the Magnetic Relay manufactured by Thomas A. Edison, Incorporated, West Orange, New Jersey.

The Magnet that Sounds the Alarm

Here's a unique application for G-E permanent magnets. As the moving element in the Edison Sensitive Relay, a tiny G-E Sintered Alnico 5 permanent magnet completes an electrical circuit . . . instantly sounding the alarm for fire.

Design specifications for this magnet application were severe. Extremely high pole tip density was required. Yet mass had to be low. Cost conscious G-E engineers worked closely with Thomas A. Edison, Incorporated. Costs were cut by redesign and by the use of Sintered Alnico 5 . . . a new magnetic alloy recently developed by General Electric.

Perhaps your permanent magnet costs can be reduced. Our design engineers will be glad to work with you to improve your product. Remember, too, that General Electric produces all grades of CAST and SINTERED ALNICO as well as special magnetic alloys for your product.

Edison Aircraft Fire Detection System—Fast, Safe, Dependable

Here's how the Sensitive Magnetic Relay fits into the Edison Fire Alarm system. An Edison thermocouple detector mounted in the area to be protected generates its own emf when a dangerously rapid rise in temperature occurs. This emf (measured in *millivolts*) actuates the Sensitive Magnetic Relay and sets off a fire alarm. When the fire is out and conditions return to normal, the detectors signal "Fire Out" and are again ready to signal "Fire" rapidly and truthfully.

CHEMICAL DEPARTMENT, SECTION 17-2
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASS.

Please send me:
( ) Bulletin, CDM-16, "G-E Permanent Magnet Subassemblies"
( ) Bulletin CDM-2A, "G-E Permanent Magnet Catalog"

Name.....Title.....
Company.....
Products Mfrd.....
Address.....
City.....State.....

PERMANENT MAGNETS

GENERAL ELECTRIC

CDM9-A1

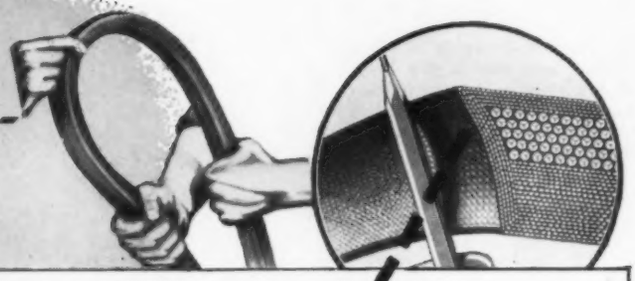
Want Additional Product Information? See Page 19.

Grip the Sides of

ANY V-Belt...

FEEL the Sides CHANGE SHAPE

as the belt Bends —



-That SHOWS you Exactly WHY

THE CONCAVE SIDE

(U. S. PATENT NO. 1813698)

SAVES You MONEY

Bend any V-Belt and you can actually feel its sides change shape.

That's because the bending puts the top of the belt under *tension,* while the body undergoes *compression.* Naturally the sides of the belt *bulge out*—and if the belt is built with *straight sides,* you get the result shown in Figures 1 and 1-A, below:—

Straight-Sided V-Belt

How Straight-Sided V-Belt Bulges in Sheave-Groove.

Clearly, the bending forces a straight-sided V-Belt into a shape that does not fit the sheave-groove—and the bulging produces excessive wear along the *middle* of the *sides.*

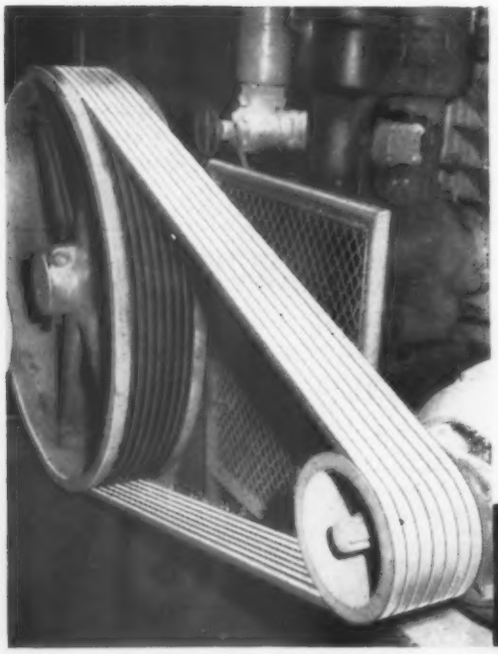
Now, bend the V-Belt built with the precisely engineered Concave Side (U. S. Patent No. 1813698)—the Gates Vulco Rope.

Gates Vulco Rope With Concave Side.

No Side Bulge. Precise Fit in Sheave-Groove.

You get the same shape change but *now* the new shape *exactly fits* the sheave-groove as shown in Figures 2 and 2-A.

Results—(1) *Uniform* side-wall wear; *longer* life. (2) *Full* sidewall grip on the pulley; carries heavier loads and sudden load increases without slippage — a big increase in drive efficiency — saving belt wear and also saving power!



The Concave Side is *MORE IMPORTANT NOW* Than Ever Before

Because the *sides* of a V-Belt are what actually *drive* the pulley, it is clear that any increased load on the belt means a heavier load that must be transmitted to the pulley *directly* through the belt's sidewalls.

Now that Gates *SPECIALIZED* Research has made available to you SUPER Vulco Ropes—carrying fully 40% higher horsepower ratings—the life-prolonging Concave Side naturally delivers greater savings today than ever before.

THE GATES RUBBER COMPANY
DENVER, U. S. A.
The World's Largest Makers of V-Belts

Gates
REG. U. S. PAT. OFF.
The Mark of SPECIALIZED Research

492

GATES VULCO ROPE DRIVES
Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

Want Additional Product Information? See Page 19.

"There's nothing under our counter"

● You can always depend on your Spang CW Pipe Distributor for a square deal. He prides himself on making no under-the-counter deals. And whenever he gets pipe, you can be sure that you will get a fair share of it.

Just as your Spang Distributor is backing up your efforts, we are backing up his. We are trying to produce more and more Spang CW. In spite of this, we are unable to keep pace with the tremendous demand for pipe.

Keep in touch with your Spang CW Pipe Distributor. Place your orders as far in advance as possible. That way you can help your distributor to help you get pipe on the job on time.

SPANG-CHALFANT

Division of The National Supply Company

EXECUTIVE OFFICES: PITTSBURGH, PA.

District Sales Offices: Atlanta; Boston; Chicago; Denver; Detroit; Houston; Los Angeles; New York; Philadelphia; Pittsburgh; St. Louis; San Francisco; Tulsa

SPANG

CW

QUALITY *that is recognized wherever pipe is used*

Want Additional Product Information? See Page 19.

What does it stand for
ON A TAP?
P&W - PRATT & WHITNEY,
of course — a name that every worker in metal associates with precision production.
Think what it means on small but critically important precision tools like taps:
• tap steel made to exacting P&W specifications and subject to rigid inspection in our large and completely equipped metallurgical laboratories.
• tap design, heat-treatment, finish, inspection that assures the very finest quality and dependability of performance.
• *tap engineering* service that goes all the way through to assure the right tap and tapping procedure for the job, the lowest cost per tapped hole, whether the tap is standard or special. P&W Taps cover all types and sizes.
Wouldn't it be a shrewd move on your part to standardize on P&W Taps? Try a few and see. Our 444-page Small Tool Catalog contains complete listings.
Pratt & Whitney
Division Niles-Bement-Pond Company
WEST HARTFORD 1, CONNECTICUT
Taps
Branch Offices: Birmingham • Boston • Chicago • Cincinnati • Cleveland • Detroit • Los Angeles
New York • Philadelphia • Pittsburgh • Rochester • San Francisco • St. Louis

Want Additional Product Information? See Page 19.

New Sherman JUMBAGS Slash PACKING COSTS

Shrouds for machinery or palletized products

Kraft covers for shipping or storage

Waterproof case liners

It's here! A jumbo bag made by a revolutionary new machine. *Now!* Uniformity and greater strength *plus* real packing economies for everyone who uses or needs giant-sized bags.

JUMBAG FACTS

1 Accordion folded. No time-consuming interfolds. Snaps open instantly in a single operation. Quicker, easier to use.

2 Fits any shape or proportion perfectly. One bag will fit several differently proportioned articles. Cuts down inventory.

3 Self-closing air vents — another new feature, optional, at no extra cost — eliminate air pockets and save time.

4 Six standard stock sizes from chair-size up to 60 inches high and 12 feet wide. Special sizes made to order.

5 Made of new strong-fibred kraft in light, medium, and heavy weight. Also available in waterproof, creped, or crinkled — neutral or stainproof.

6 *Prompt deliveries.* Stock sizes ready for instant delivery through 200 paper distributors. Immediate service on special sizes.

7 Low cost – substantial savings over hand-made bags.

Sherman PAPER PRODUCTS CORPORATION

Newton Upper Falls 64, Mass. • LOS ANGELES • NEW YORK • CHICAGO

SEND TODAY FOR *FREE* SAMPLE

Sherman Paper Products Corp.
Newton Upper Falls 64, Mass. 6

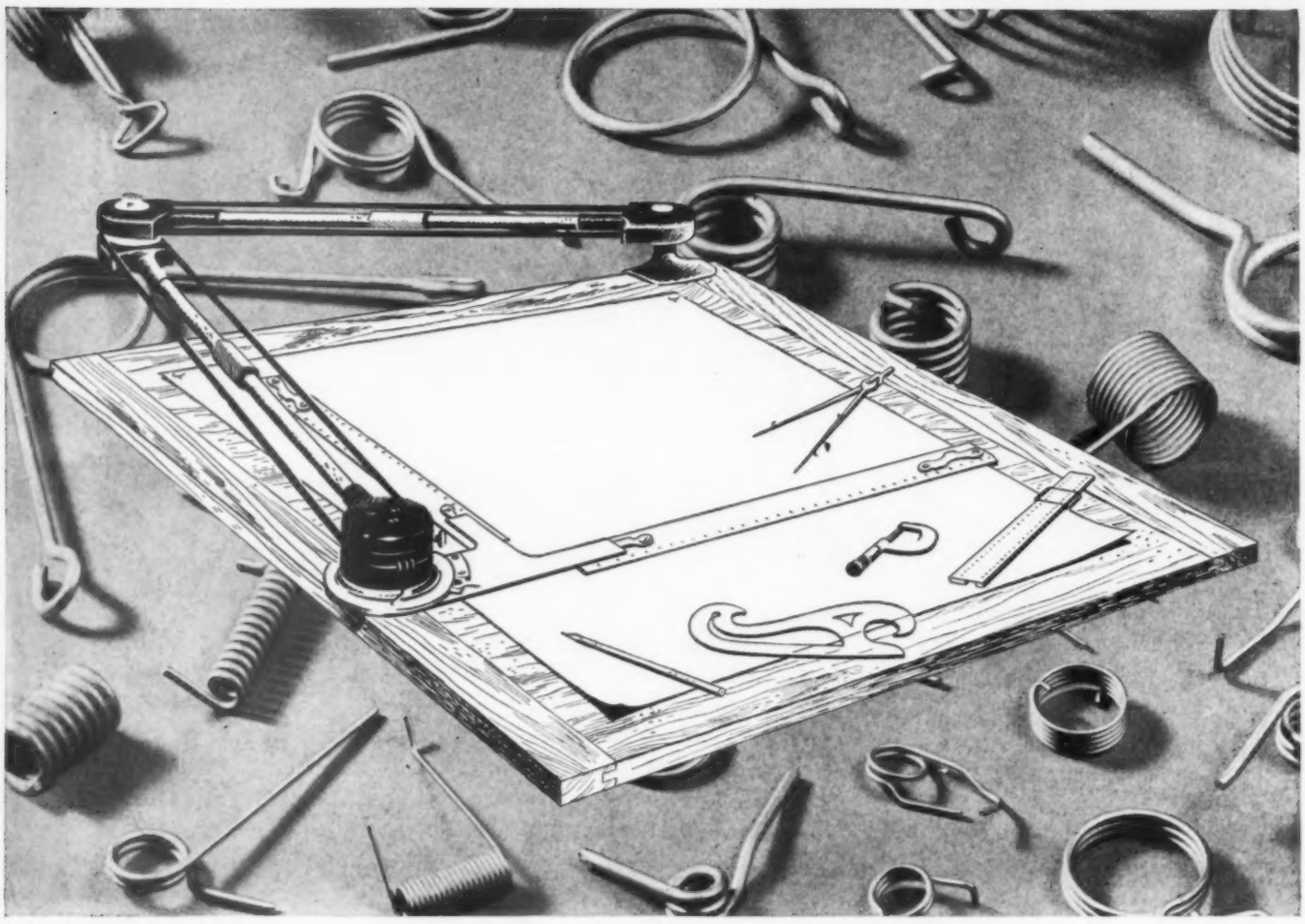
Rush me FREE TRIAL Samples of Sherman JUMBAG and folder giving full details.

Name _____

Address _____

City _____ State _____

Want Additional Product Information? See Page 19.



BLANK PAPER . . . and an Idea

THE DESIGN of a satisfactory spring involves innumerable factors—load, deflection, size, shape, finish—to mention a few. Having determined these requirements, Wickwire Spencer engineers begin—with brains and blank paper—to establish the proper relationship between these factors and to design a spring that will stand up under the service requirements demanded.

The same exacting care that characterizes the design of springs and wire forms, is equally true as far as manufacturing procedures are concerned. Every coil of wire used in making springs undergoes exhaustive tests before manufacture. Skilled toolmakers set up machines that make springs conform to exacting specifications. And finally, the springs are tested before shipment.

This beginning-to-end-control has saved time, trouble and expense for scores of manufacturers—has won many loyal customers for us. Our engineers are at your service in designing any conceivable type of wire spring or wire form. Why not write us? Also, we would like to send you our free book, "Springs and Formed Wires." It's free—and full of valuable data relating to spring selection and performance. Address your request to Spring Dept., Wickwire Spencer Steel Division of C. F. & I., 2 New Bond St., Worcester 6, Mass.

CF&I WICKWIRE SPENCER SPRINGS

A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

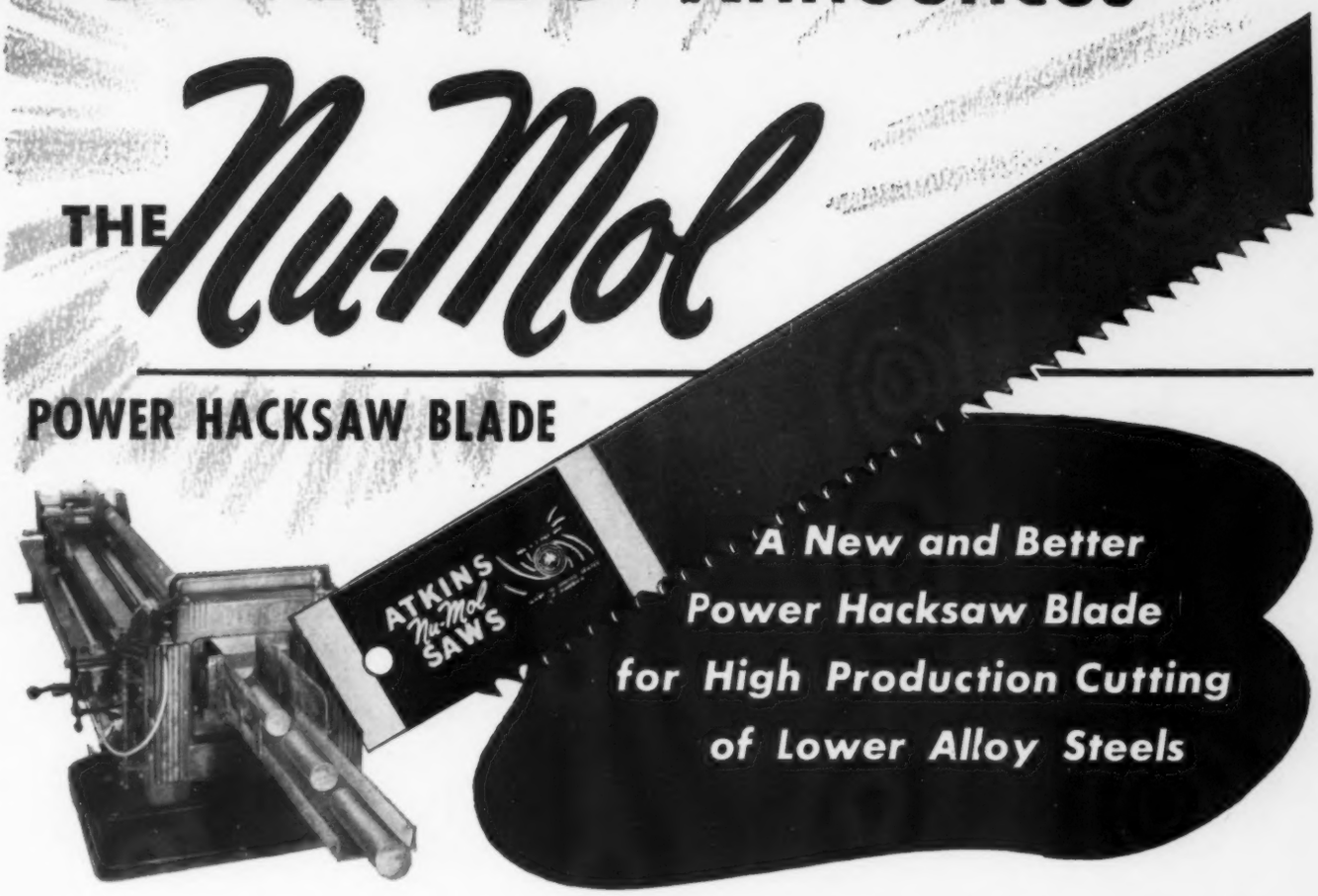
SPRING SALES OFFICE AND PLANT—2 New Bond St., Worcester 6, Mass.
EXECUTIVE OFFICE—500 Fifth Avenue, New York 18, N. Y.
SALES OFFICES—Boston • Buffalo • Chicago • Denver • New York
PACIFIC COAST—The California Wire Cloth Corp., Oakland 6, Calif.

Want Additional Product Information? See Page 19.

ATKINS Announces

THE Nu-Mol

POWER HACKSAW BLADE



A New and Better Power Hacksaw Blade for High Production Cutting of Lower Alloy Steels

LOOK at These Typical NU-MOL Performance Reports

NM 614P	249 pcs. 1" rd. SAE 4140
NM 4714	8 machines, 1 blade each 35,000 sq. in. 4½" sq. 1045
NM 6718	9 hrs. continuous cutting stainless steel.

Twenty-five years ago Atkins introduced the first high speed steel hacksaws to be made in the United States. Today, in their field, Atkins "Silver Steel" Hacksaws are still the finest blade made . . . excellent for sawing any of the high carbon, tough jobs, or any other steels that can be cut with hacksaws.

NOW, in the field of sawing lower alloy steels, where high production cutting is essential, the NU-MOL rounds out the Atkins line of blades that covers every type of hacksaw requirement.

NU-MOL is the result of years of metallurgical research, from which have developed new methods of manufacturing and heat treating.

NU-MOL is a tough, yet exceptionally flexible power hacksaw blade. It reduces blade breakage to a minimum. Its teeth stay sharp longer with little chipping. Resistance to abrasive action is excellent.

NU-MOL cuts fast and clean to extremely close tolerances. NU-MOL reduces your costs due to longer blade life.

Find out what NU-MOL can do for you. Ask your Industrial Distributor to demonstrate the new NU-MOL performance on your own cutting jobs. Get in touch with him today.

NU-MOL Power Hacksaw Blades are Packaged 10 to a Box.

Available in all standard lengths and tooth sizes.

ATKINS

E. C. ATKINS AND COMPANY • *Home Office and Factory:* 402 S. Illinois Street, Indianapolis 9, Indiana
Branch Factory: Portland, Oregon • *Branch Offices:* Atlanta • Chicago • New Orleans • New York • San Francisco

AAA TRADE MARK ATKINS "ATKINS ALWAYS AHEAD"

MAKERS OF BETTER SAWS FOR EVERY CUTTING JOB

Want Additional Product Information? See Page 19.

UPSET AND FLANGED
"Standard" Tubing Techniques
INSERT SPOTWELDED
SWAGE TAPERED
UPSET AND FLARED
Apply the Versatility of "Standard" UPSET FORGING to Your Product
The upset forging facilities and techniques at "Standard" make possible this one-piece tube. Starting with a 3.4 O.D. by .134 wall tube, upset and flanged at one end to 5.12 O.D. by .520 thickness—tapered at opposite end to 2.240 O.D. and belled to 4.65 O.D. with .320 wall thickness—separate forgings and welding operations are unnecessary.
Specify STANDARD—It Pays!
THE STANDARD TUBE CO.
Detroit 28, Michigan
Welded Tubing
Fabricated Parts
STANDARDIZE with "STANDARD" — It Pays
Sizes ½" O.D. to 5½" O.D., 22 B.W.G. to 3 B.W.G.

Want Additional Product Information? See Page 19.

MICROTRIP... the power press safety device that increases production 3 ways...

MICROTRIP control box and switches. A special bridge circuit is so arranged that accidental or deliberate operation of only one switch will immediately open the control circuit and make it inoperative.

MICROTRIP is a new safety device which provides increased production and added safety. It is an electrical control for actuating tripping mechanisms on punch presses, spot welding and riveting machines, and air presses.

Finger-tip actuation . . . as little as 10 ounces . . . permits steady, fast press work with a minimum fatigue factor. Realization that both hands must be out of the hazard area before a press can operate also increases the speed of operation.

Unless both switches are touched at the same time the control circuit automatically becomes inoperative. It remains so until a button on the side of the control box is manually reset. It cannot be "cheated".

MICROTRIP is quickly and easily installed on present equipment. It is a product of MICRO SWITCH, whose precision switches are well known throughout industry.

Write MICRO SWITCH today.

© 1949 First Industrial Corp.

MICRO MS SWITCH
TRADE MARK
A DIVISION OF FIRST INDUSTRIAL CORPORATION
FREEPORT, ILLINOIS, U. S. A.

Branch Offices: Chicago • New York • Boston • Cleveland • Los Angeles **Sales Representatives:** Portland • St. Louis • Dallas • Toronto

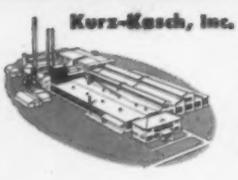
Want Additional Product Information? See Page 19.

Inside story on the outside of a picture

Television by RCA Victor means entertainment for the millions—but this lower priced, high-quality RCA Victor television set also provides serious food for thought for manufacturers of many other products.
The bezel framing the 10" kinescope, RCA Victor stylists said, should be metal. "Nope," said Engineering, "metal bezels that big have a tendency to pick up electrical disturbances in some areas. Won't meet RCA Victor standards!" "Nope," said Costs, "a complex metal shape that size runs up cost out of proportion!"
"Well, then—metallic appearance," conceded Styling.
So, on the basis of better properties and lower costs, we're plunger-moulding the bezel of plastics. *Heat-resistant* phenolic. Heat-resistant, because big as it is—thin-sectioned as it is—it withstands 1 hour of 250°F. without distortion while a gold enamel finish is baked in. It's tapped, ready to mount, with a minimum of warp, by only 4 corner bosses — to meet RCA Victor's exacting standards.

Kurz-Kasch

FOR OVER 33 YEARS PLANNERS AND MOULDERS IN PLASTICS



Kurz-Kasch, Inc. • 1431 South Broadway • Dayton 1, Ohio

BRANCH SALES OFFICES: New York, *Lexington 2-6677* Chicago, *Harrison 5473* • Detroit, *Randolph 5214* Los Angeles, *Prospect 7503* • Dallas, *Lakeside 1022* St. Louis, *Rosedale 3542* • Toronto, Canada, *Adelaide 1377.*

EXPORT OFFICES: 89 Broad Street, New York City, *Bowling Green 9-7751.*

In meeting RCA Victor's specifications on this job, we're justifying again the Kurz-Kasch reputation for superior moulding. Whatever your problems—if they call for imagination in compression, transfer or plunger techniques—we've got the men, the plant, the equipment, and the record of accomplishment. We're ready to tackle the complete job—to handle long runs—to set up and meet early delivery schedules—and we've been doing it since pioneering began in Plastics. May we send an engineer to talk things over?

Want Additional Product Information? See Page 19.

CELANESE* ACETIC ACID

$CH_3-C(=O)-OH$

Celanese* Glacial Acetic Acid, with a purity greater than 99.5%, is now being made available to a much greater portion of American industry. The high quality of this chemical makes it ideally suited for applications in pharmaceuticals, textile treatment and in organic syntheses. This versatile acid is also used in the production of acetate esters for the varnish and lacquer industries.

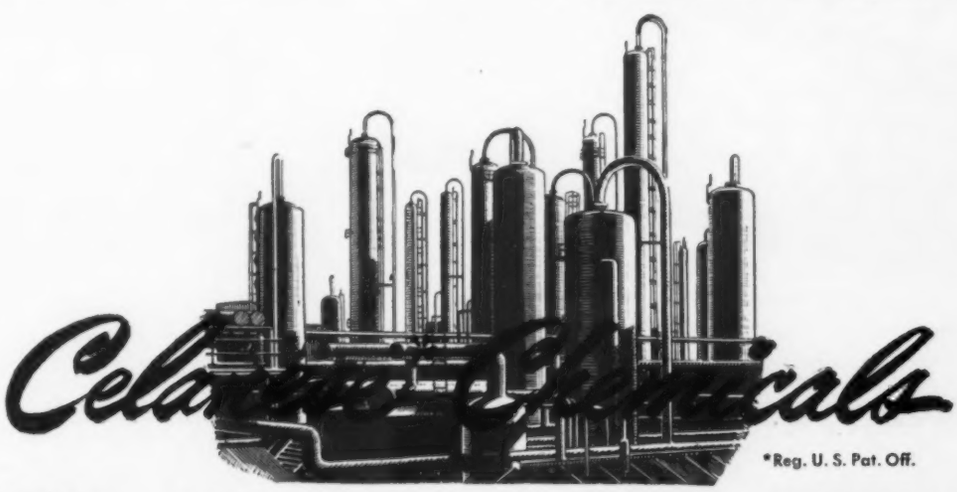
Water Content	0.5% by weight, maximum
Freezing Point	15.6° C., minimum
Specific Gravity	1.050 to 1.055 @ 20/20° C.
Color	Water White
Formic Acid Content	0.2% by weight, maximum
Non-Volatile Matter	0.001% by weight, maximum
Iron Content	1.0 PPM by weight, maximum

A new brochure is available containing specifications and general information on many of the Celanese* Organic Chemicals. Write for your copy—and call Celanese whenever you need technical assistance regarding organics.

CELANESE CORPORATION OF AMERICA
Chemical Division
180 Madison Avenue, New York 16, N.Y.

CELANESE* FORMALDEHYDE

Formaldehyde, one of the most important products in the growing family of Celanese Organic Chemicals, is now offered in greater volume. This high quality, U.S.P. chemical is sold commercially as Formalin, a water white solution containing 40% formaldehyde by volume, 37% by weight. It is obtainable in both methanol inhibited and uninhibited grades.



Celanese Chemicals

*Reg. U. S. Pat. Off.

ALCOHOLS • ALDEHYDES • GLYCOLS • KETONES • ACIDS • SOLVENTS • PLASTICIZERS • INTERMEDIATES

Want Additional Product Information? See Page 19.

"Don't worry, dear, he can't hurt it. It's put together with Circle Ⓑ Fasteners."

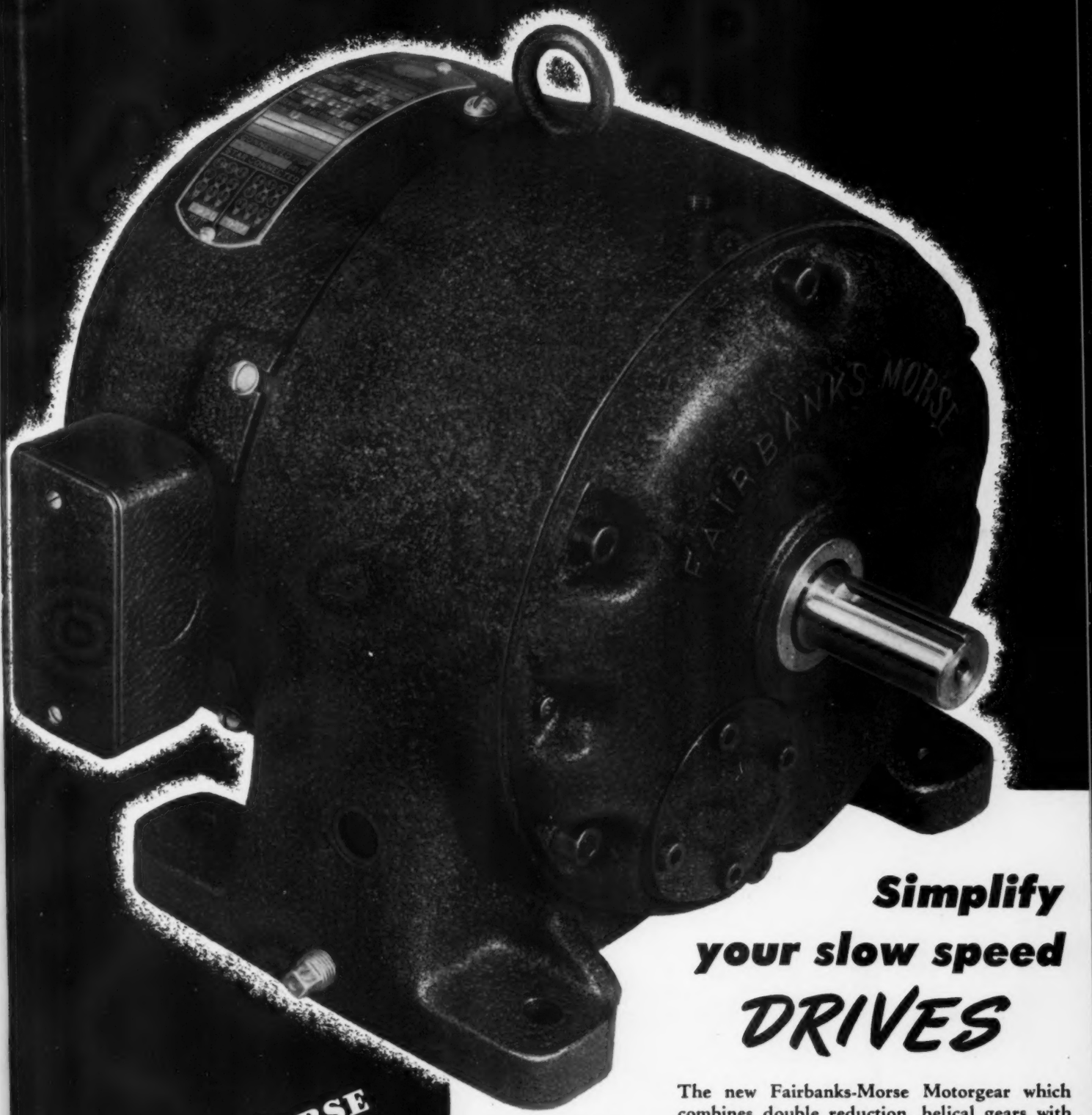
circle B bolts

Circle Ⓑ Bolts and Nuts... both standard and special... are manufactured on the latest precision machinery. They are held to close tolerances that assure easy installation and dependable service.

BUFFALO BOLT COMPANY
North Tonawanda, N. Y.
Sales Offices in Principal Cities. Export Sales Office: Buffalo International Corp. 50 Church Street, New York City

PRODUCERS OF CIRCLE Ⓑ PRODUCTS — BOLTS • NUTS • RIVETS AND SPECIAL FASTENERS

Want Additional Product Information? See Page 19.



FAIRBANKS-MORSE

motorgear

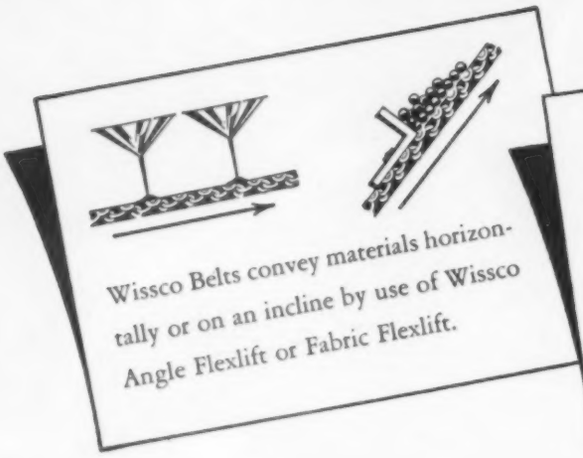
Simplify your slow speed DRIVES

The new Fairbanks-Morse Motorgear which combines double reduction, helical gears with the well-known Axial Air Gap Motor *is a complete slow speed unit — more compact than the average electric motor alone!* Wherever you are using a slow-speed drive in standard ratios up to and including 10 h.p., the Motorgear will save space and weight, minimize servicing and improve the appearance of the driven unit. Send for a Motorgear bulletin. Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE

A name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS
STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS



Wissco Belts convey materials horizontally or on an incline by use of Wissco Angle Flexlift or Fabric Flexlift.

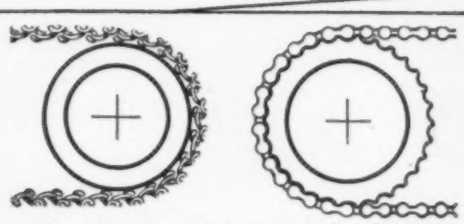
Wissco Belts are built to operate efficiently at temperatures as low as –40°F. or to withstand temperatures as high as 2100°F.

Whether your product is light or heavy, large or small, Wickwire can custom-engineer a belt to carry it safely and efficiently.

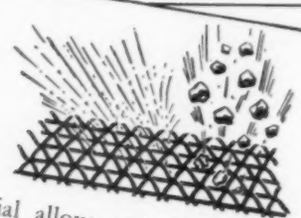
WISSCO BELTS' ADAPTABILITY

ANSWERS INNUMERABLE PROCESSING PROBLEMS

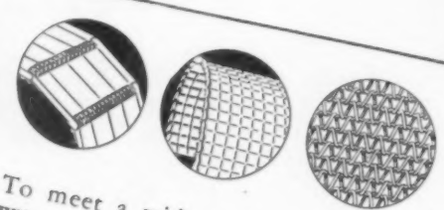
FIFTY YEARS of pioneering in belt development and design have provided the know-how for solving difficult problems—for custom-engineering Wissco Belts with the stamina and built-in toughness that insure new highs in production, new lows in cost. Why not avail yourself of the services of our belt engineers. There is no obligation—and it may provide the cost-cutting answer to rising production costs.



Wissco Belts are designed for friction drive installations or combined with several types of chain edge constructions for use on positive drive equipment.



Special alloys and chemical resistant metals are used in making Wissco Belts that must withstand corrosion, abrasion and other destructive forces.



To meet a wide variety of needs, Wissco Belts are available in a number of woven wire constructions and in plate and channel type constructions.

Let us send you our illustrated catalog showing types and advantages of numerous conveyor belt constructions. Write to our nearest office.

WISSCO METAL CONVEYOR BELTS

A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

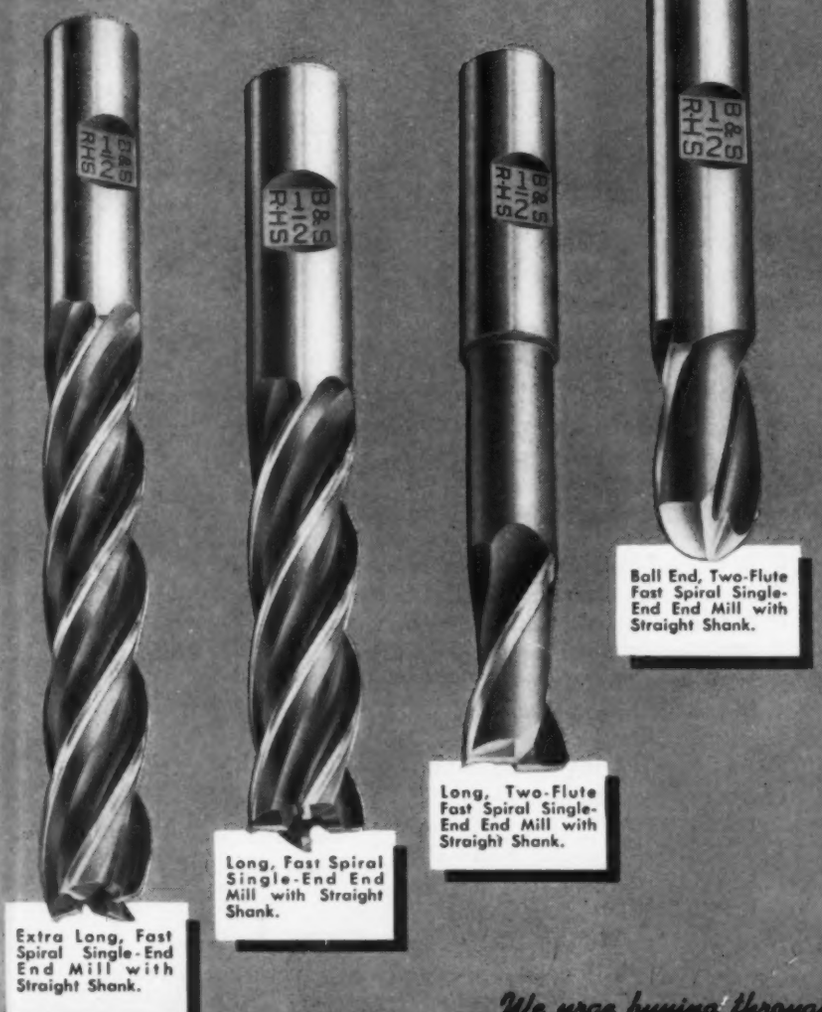
CF&I

Belt Sales Office and Plant—56 Sterling St., Clinton, Mass. • *Executive Office*—500 Fifth Avenue, New York 18, N. Y.

Sales Offices—Boston, Buffalo, Chattanooga, Chicago, Denver, New York • *Pacific Coast Subsidiary*—The California Wire Cloth Corp., Oakland 6, Cal.

Want Additional Product Information? See Page 19.

For More Accurate Selection of Quality End Mills BROWN & SHARPE OFFERS 8 ADDITIONAL TYPES

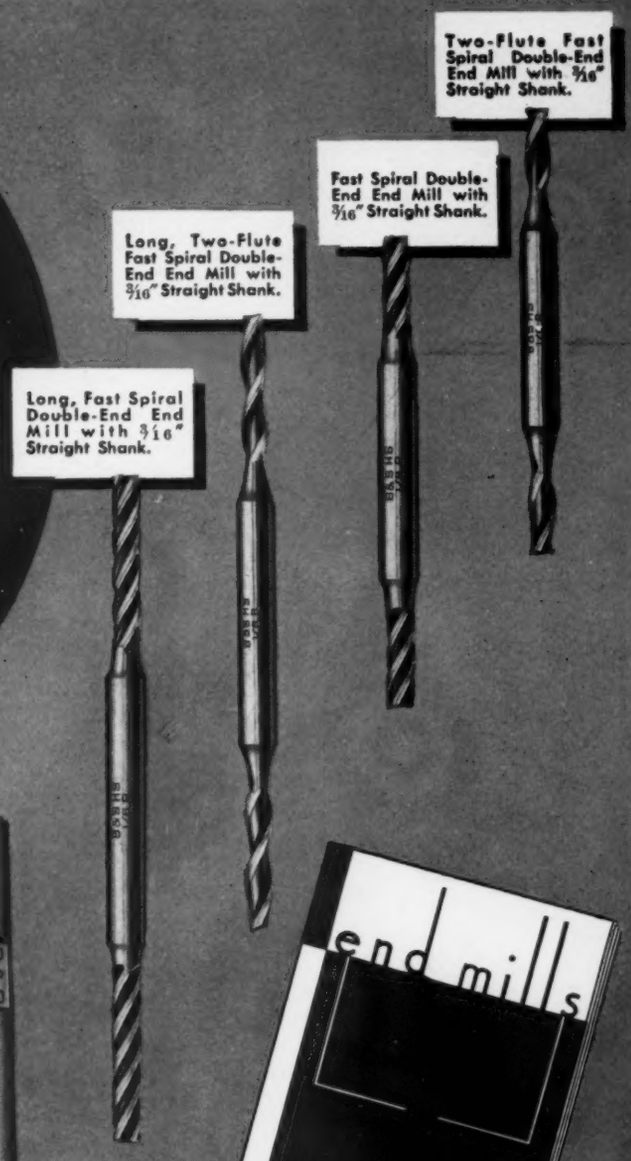


Extra Long, Fast Spiral Single-End End Mill with Straight Shank.

Long, Fast Spiral Single-End End Mill with Straight Shank.

Long, Two-Flute Fast Spiral Single-End End Mill with Straight Shank.

Ball End, Two-Flute Fast Spiral Single-End End Mill with Straight Shank.



Long, Fast Spiral Double-End End Mill with 3/16" Straight Shank.

Long, Two-Flute Fast Spiral Double-End End Mill with 3/16" Straight Shank.

Fast Spiral Double-End End Mill with 3/16" Straight Shank.

Two-Flute Fast Spiral Double-End End Mill with 3/16" Straight Shank.

WRITE FOR THE NEW HANDY-SIZE CATALOG

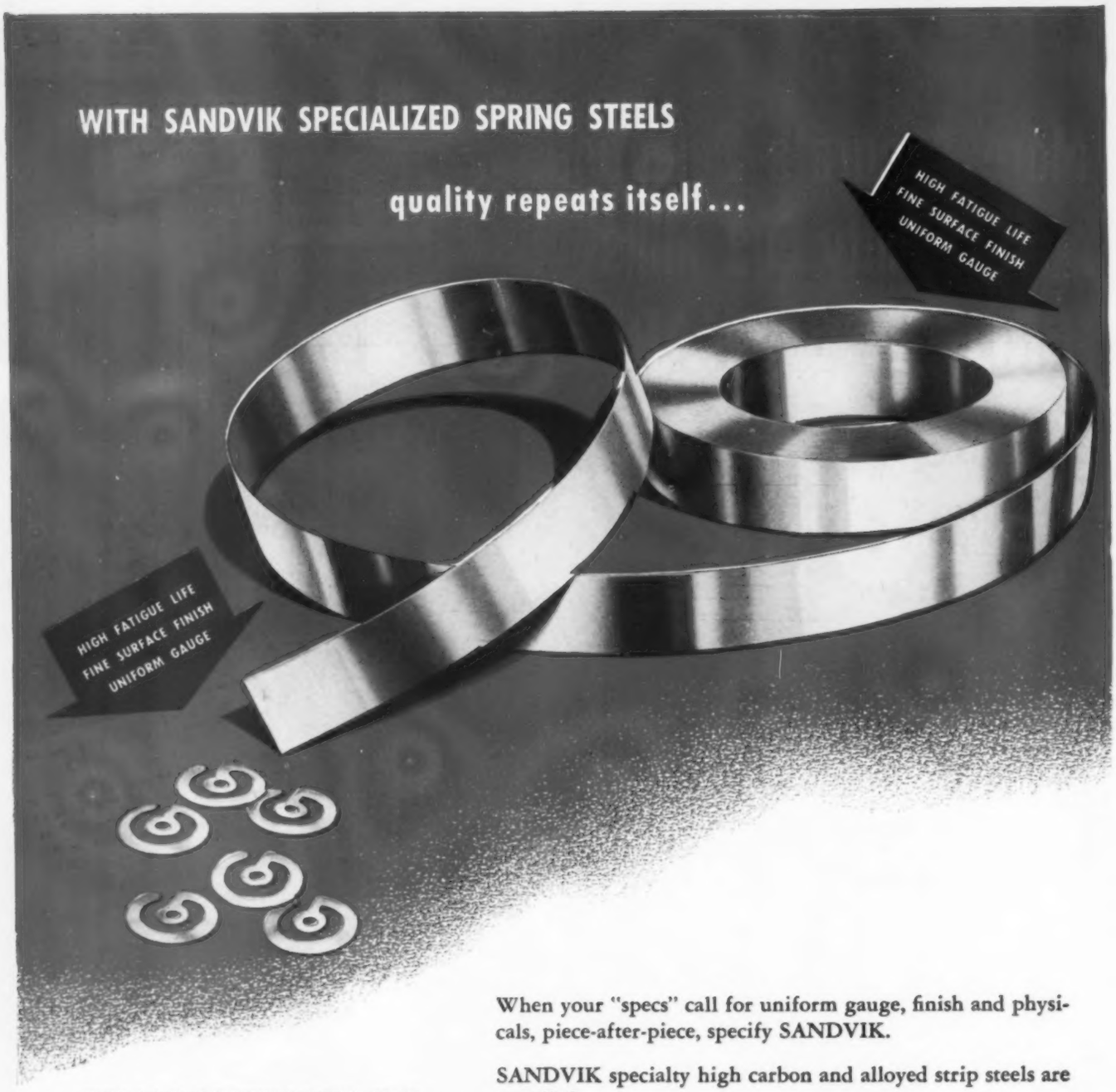
describing important production-improving features of all Brown & Sharpe End Mills together with complete specifications and prices. There's a Brown & Sharpe quality end mill to meet every end milling need. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

We urge buying through the Distributor

BROWN & SHARPE CUTTERS B·S

WITH SANDVIK SPECIALIZED SPRING STEELS

quality repeats itself...



SOME SANDVIK SPECIALTY SPRING STEELS

Band Saw Steels; Metal Band, Wood Band and Butcher Band • Camera Shutter Steel • Clock and Watch Spring Steels • Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel Flapper Valve Steel • Knife Steels Razor Blade Steel • Reed Steel • Shock Absorber Steel • Sinker Steel • Spring Steels • Tape and Rule Steel • Textile Steels • Trowel Steel • Vibrator Reed Steel

When your "specs" call for uniform gauge, finish and physicals, piece-after-piece, specify SANDVIK.

SANDVIK specialty high carbon and alloyed strip steels are supplied:

- **In special analyses for specific applications**
- **Annealed, unannealed or hardened and tempered**
- **Precision-rolled in thicknesses from .001"**
- **With bright finish or polished bright, yellow or blue**
- **With round edges or square edges**
- **In a wide range of widths**

Phone or write for further information, technical advice or current stock lists.

SS-38

Sandvik Quality Steels

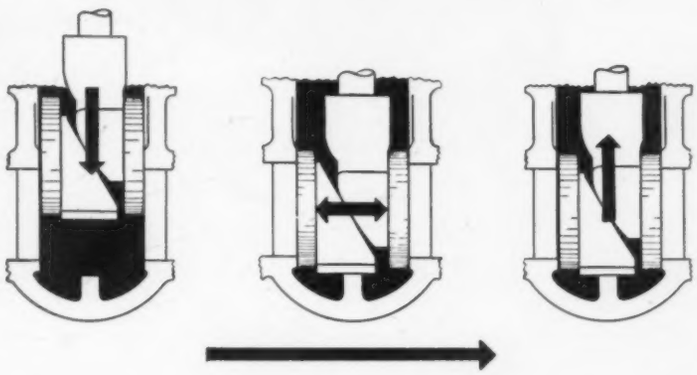
SANDVIK STEEL, INC.

111 EIGHTH AVE., NEW YORK 11, N. Y., WAtkins 9-7180
180 N. Michigan Ave., Chicago 1, Ill., FRanklin 2-1745
1736 Columbus Rd., Cleveland 13, Ohio, CHerry 2303
WAREHOUSES: New York and Cleveland

Want Additional Product Information? See Page 19.

*Ingenuity in gate valve design fulfills seven objectives**

ELIMINATION OF DISC-TO-SEAT FRICTION AND GALLING

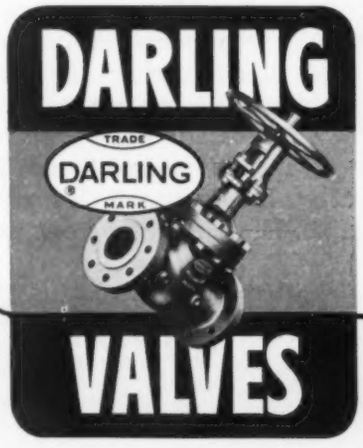


THOUSANDS of valves are ruined every year because their design makes it necessary to "jam" them shut and "break" them open. The valve discs and seats are subjected to severe friction and galling, a major cause of leaks, unreliable performance and excessive maintenance cost.

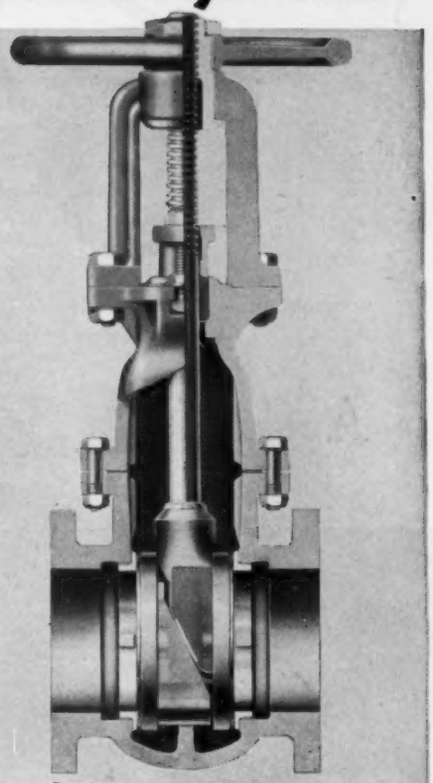
The above sketches show how this condition has been completely eliminated in the unique design of Darling Fully Revolving Double Disc Parallel Seat Gate Valves. The discs are lowered all the way with minimum disc-to-seat friction. Next, the positive wedging action spreads the discs for tight contact against their seats. When opening the valve, the first turn of the stem completely releases wedging pressure on the discs.

This is a unique, positive release feature—one of the principal reasons why hundreds of users have found Darling Valves so reliable and easy to operate—sure to last longer, with minimum maintenance cost.

DARLING VALVE & MANUFACTURING CO.
WILLIAMSPORT 7, PA.



Outline your needs and ask for specific data on the proper Darling Valves . . . or send for the complete 300-page Darling Catalog No. 17M. It describes Darling Valves of *all* types and is full of valuable information.



*This advertisement is one of a series showing how the unique Darling Fully Revolving Double Disc Parallel Seat Gate Valves answer the following critical operating problems:

- Positive, easy closing—regardless.
- Automatic adjustment for valve body distortion.
- Elimination of disc-to-seat friction and galling.
- Uniform wear distribution.
- Extreme simplicity.
- Greater service life.
- Simplified maintenance.

Darling Parallel Seat Gate Valves are available in a wide range of sizes and constructions for all types of normal and unusual service, and for pressures up to 3000 pounds. Likewise, Darling Taper Seat, Solid or Slotted Wedge Gate Valves are available for most services.

CORROSION RESISTANT VALVES

In addition to conventional iron, bronze and steel constructions, Darling specializes in valves for any corrosive fluid: iron body valves with special alloy trim; iron body, rubber lined with special alloy trim; all bronze; and all special alloy. Darling's 50 years of experience in meeting unusual requirements is always at your service.

THE VALVE MARK OF QUALITY . . . WATCH FOR IT

Want Additional Product Information? See Page 19.

A Great Seller

...because it's a Comfortable Eye-Protector!

AO F-9200 Acetate Goggle

When we brought it out, we were sure there was a great future ahead for this goggle of non-flammable cellulose acetate butyrate—but its popularity has surprised even ourselves! Here are its features that workers appreciate:

1. ASSURED PROTECTION.
2. Hinges and temples out of line of sight.
3. Smarter appearance.
4. Lenses that conform to and cover eye orbit.
5. Improved fit.
6. Comfortable, lightweight, face-formed bridge.
7. Nosepads which distribute goggle weight *evenly*.

This goggle does a prime protection job on operations in chemical and electrical plants where the tiniest spark might cause fire or explosion. Because of its acetate construction it is especially recommended for these and similar jobs where metal goggles might not be recommended. Available with ventilated side shields for added safety against lateral-striking objects. Lenses are 6-Curve Super Armorplate. When protection from glare, ultraviolet or infra-red radiations is a "must", specify Calobar lenses. For a handy source of supply, see the AO representative. There is always one near you.

Safety Division of

American Optical COMPANY

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

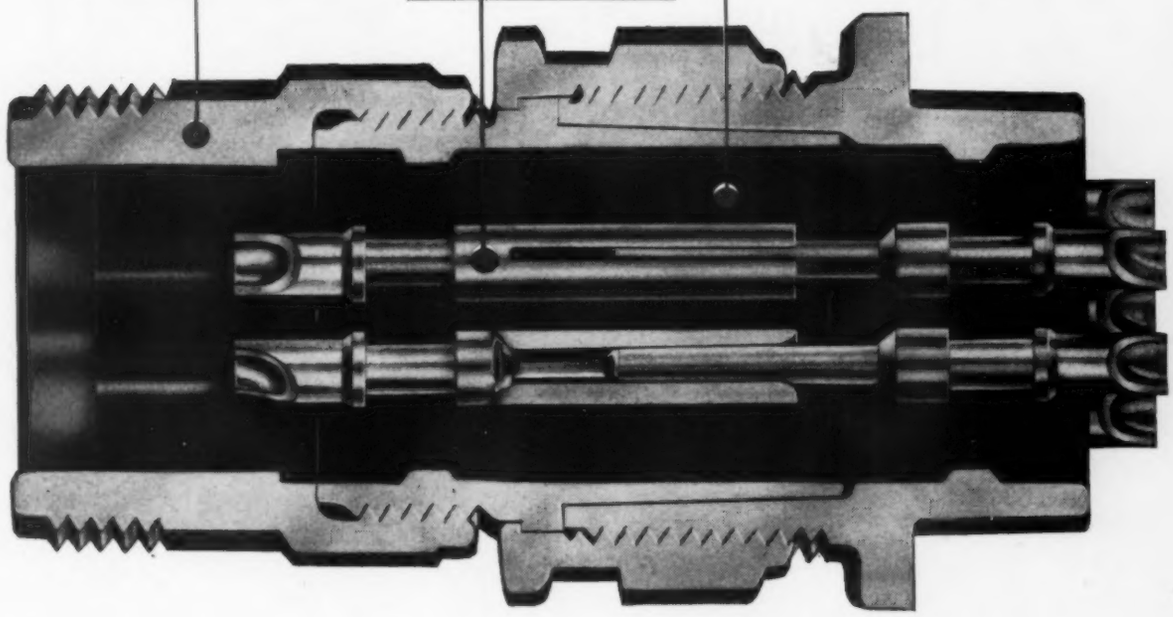
Want Additional Product Information? See Page 19.

JUST LOOK AT THESE FEATURES . . .

SHELL
High strength aluminum alloy . . . High resistance to corrosion . . . with surface finish.

CONTACTS
High current capacity . . . Practically no voltage drop. No additional solder required.

SCINFLEX ONE-PIECE INSERT
High dielectric strength . . . High insulation resistance.



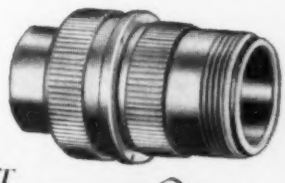
BENDIX-SCINTILLA
ELECTRICAL CONNECTORS

the Finest money can buy! Contacts that carry maximum currents with a minimum voltage drop are only part of the many new advantages you get with Bendix-Scintilla* Electrical Connectors. The use of "Scinflex" dielectric material, an exclusive new Bendix-Scintilla development of outstanding stability, increases resistance to flashover and creepage. In temperature extremes, from −67° F. to +300° F., performance is remarkable. Dielectric strength is never less than 300 volts per mil. Bendix-Scintilla Connectors have fewer parts than any other connector on the market—and that means lower maintenance costs and better performance.

*TRADEMARK

CHECK THESE OTHER ADVANTAGES

• Moisture-proof, Pressure-tight • Radio Quiet • Single-piece Inserts • Vibration-proof • Light Weight • High Insulation Resistance • Easy Assembly and Disassembly • Fewer Parts than any other Connector • No additional solder required



WRITE DIRECT TO
THE SALES DEPARTMENT
SCINTILLA MAGNETO DIVISION of
SIDNEY, NEW YORK

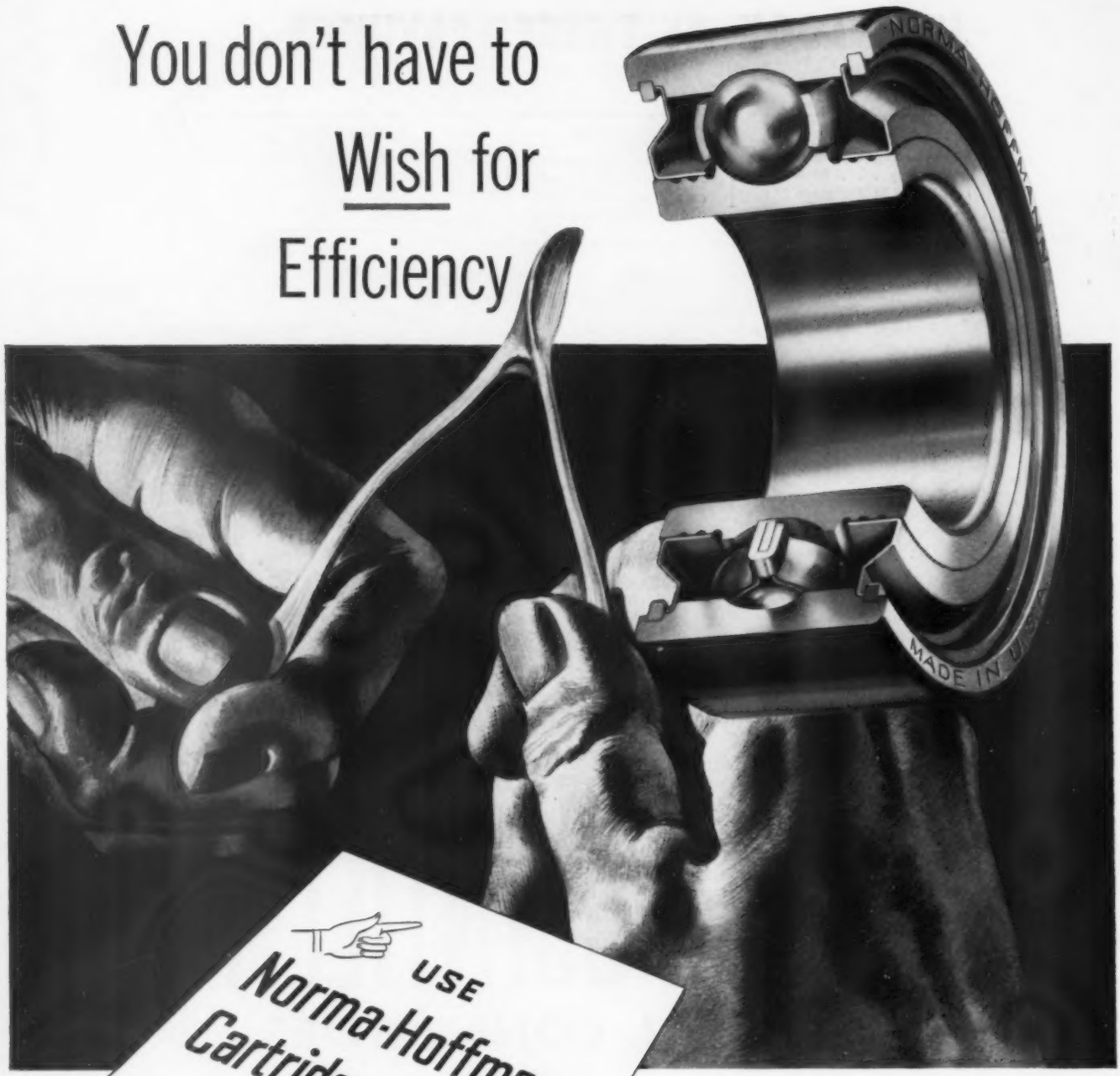
BENDIX SCINTILLA

Bendix AVIATION CORPORATION

Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, New York

Want Additional Product Information? See Page 19.

You don't have to Wish for Efficiency



Bearing performance becomes a reality when you use the Norma-Hoffmann "Cartridge" Bearing in your products. This double-row width bearing has 100% greater grease capacity than conventional bearings. The highly efficient seals lock grease in . . . keep dirt out. Carefully factory-packed with Norma-Hoffmann's specially compounded grease assures high antifriction performance for years on end. These are but a few of the reasons why the Norma-Hoffmann "Cartridge" Bearing is *"America's No. 1 Sealed Bearing."*

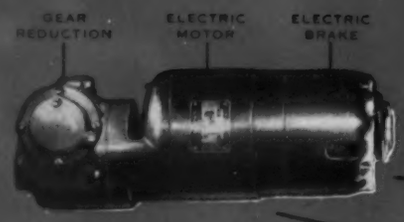
Norma-Hoffmann

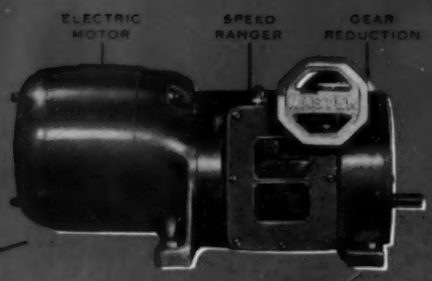
AMERICA'S NO. 1 SEALED BEARING

NORMA-HOFFMANN BEARINGS CORP.
Stamford, Connecticut

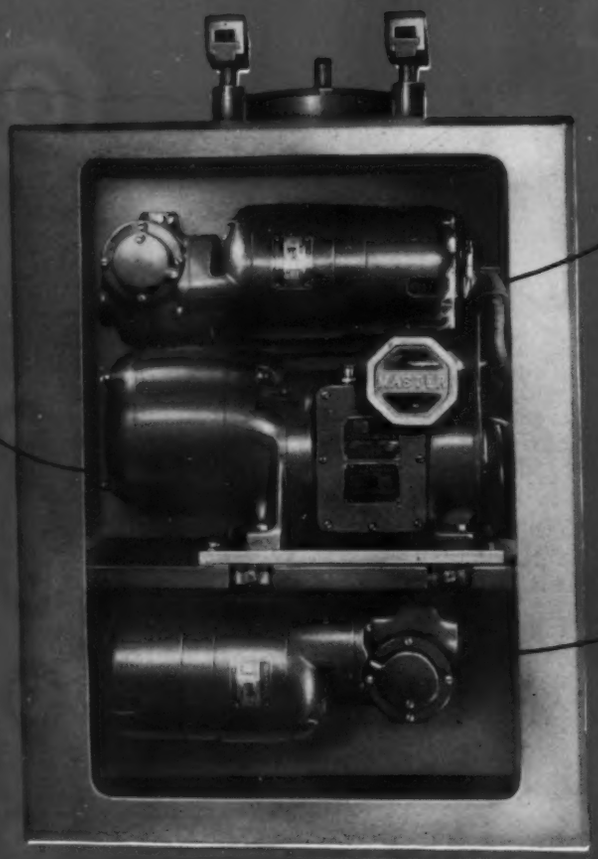
Field Offices: New York • Chicago • Cleveland • Detroit
Pittsburgh • Cincinnati • Los Angeles • San Francisco • Dallas
Seattle • Phoenix

Want Additional Product Information? See Page 19.





Easy does it

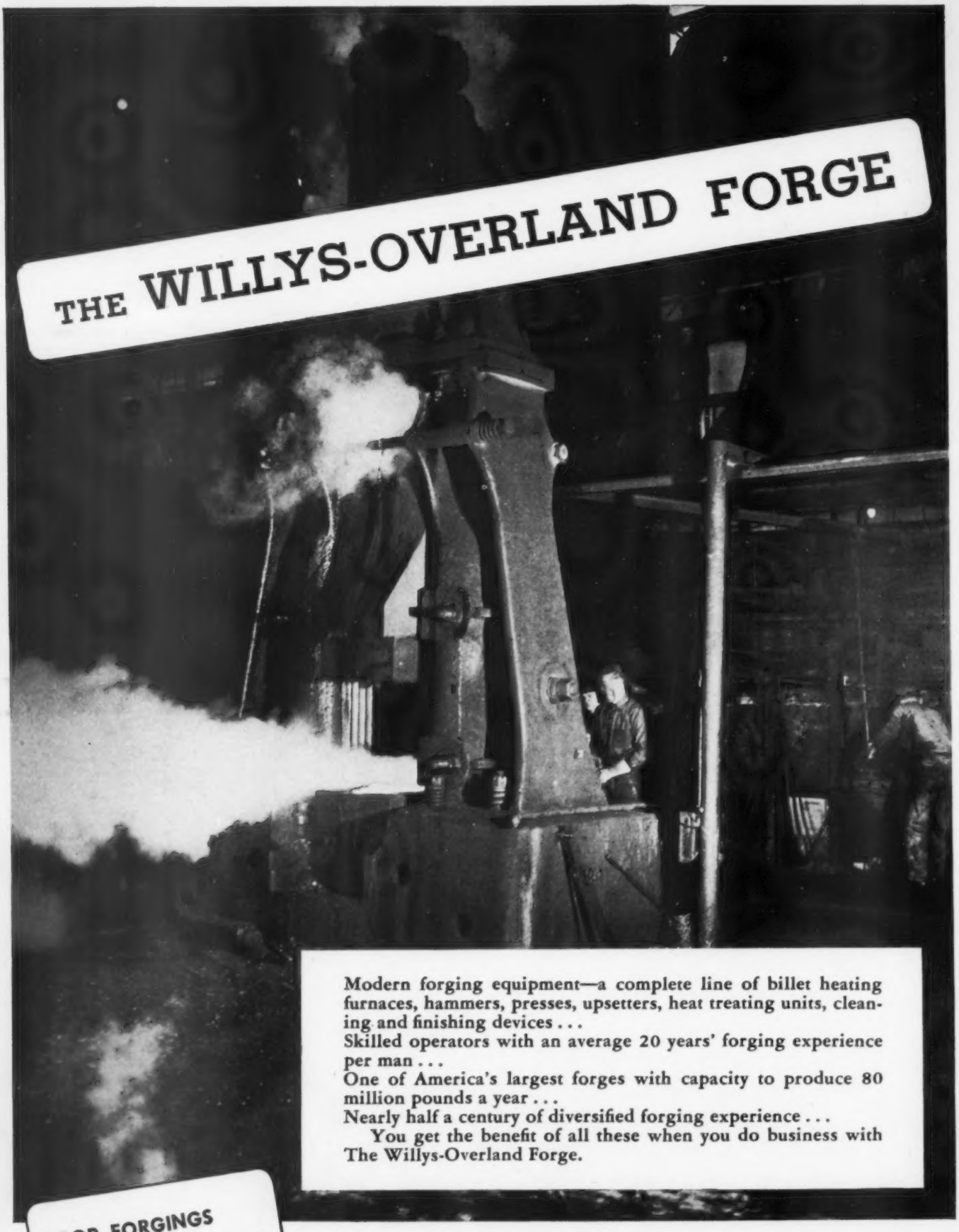


Don't put up with make-shift assemblies when it is so easy to get the RIGHT horsepower, the RIGHT shaft speed, the RIGHT construction features, the RIGHT mounting . . . all combined into one compact power package.

Master Motors, available in millions on millions of combinations of types and ratings, permit you to use a power drive on each job that's just right . . . a power drive that will add greatly to the compactness, appearance, and economy of each of your applications.

Use Master Motors to increase the salability of your motor-driven products . . . improve the economy and productivity of your plant equipment. They're the horsesense way to use horsepower.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO



Modern forging equipment—a complete line of billet heating furnaces, hammers, presses, upsetters, heat treating units, cleaning and finishing devices . . .
Skilled operators with an average 20 years' forging experience per man . . .
One of America's largest forges with capacity to produce 80 million pounds a year . . .
Nearly half a century of diversified forging experience . . .
You get the benefit of all these when you do business with The Willys-Overland Forge.

DROP FORGINGS
HOT PRESS FORGINGS
UPSET FORGINGS

For complete information, write, wire or telephone

THE WILLYS-OVERLAND FORGE

WILLYS-OVERLAND MOTORS, INC., TOLEDO 1, OHIO

Want Additional Product Information? See Page 19.

THE GREENFIELD STORY
of Service and Quality

"Built-In"

THE tap is not a tool whose value can be told by its looks. It is only in its performance that its merit becomes manifest. If it threads thousands of holes at high speeds with undeviating accuracy, it is a good tap. Its true value is built into it by the maker in his selection of steel, his workmanship, and his refinements of design that are rarely visible to the eye. There is, we believe, still another important "built-in" value in "Greenfield" taps. It is the service which is available to the tap user from the distinguished list of distributors who stock the "Greenfield" line from coast to coast; and the on-the-spot help which is available from the trained "Greenfield Man" on any threading problem at any time. *Such "built-in" values are an important chapter in the "Greenfield" story of service and quality.*

GREENFIELD TAP and DIE CORPORATION
Greenfield, Massachusetts

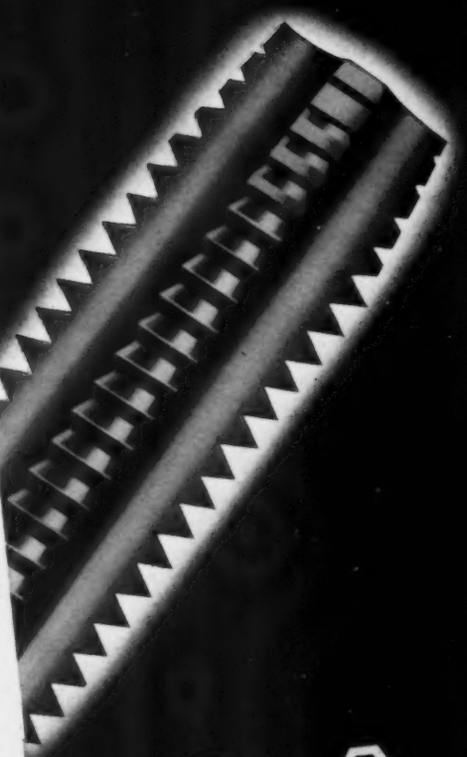
and

THE GEOMETRIC TOOL CO.
New Haven 15, Connecticut

and

AMPCO TWIST DRILL CORP.
Jackson, Michigan

Divisions of Greenfield Tap and Die Corporation



GTD
GREENFIELD

Be Sure
Buy "Greenfield"

Your
WORLD MARKETPLACE...

Canadian International Trade Fair

MAY 30—JUNE 10, 1949,
TORONTO, CANADA

You can accomplish all the results of a round-the-world business trip in a single visit to the Canadian International Trade Fair.

All the products or equipment which you need in your business are on display—and for sale—from every quarter of the globe. Every exhibit is conveniently grouped according to trade classification, regardless of country of origin.

You can compare the goods of many countries and complete immediate transactions with your next-door neighbour or a nation on the other side of the world.

Plan now to attend. For full particulars consult any of the following Canadian Trade Representatives in the United States: ***Washington***—Commercial Counsellor, Canadian Embassy. ***New York City***—Canadian Government Trade Commissioner, Rockefeller Centre. ***Detroit***—Consul of Canada, Canadian Consulate, Penobscot Building. ***Chicago***—Consul-General of Canada, Chicago Daily News Building. ***Los Angeles***—Canadian Government Trade Commissioner, Associated Realty Building. ***San Francisco***—Consul-General of Canada, Kohl Building.

Or write direct to: **THE ADMINISTRATOR,**
Canadian International Trade Fair,
Toronto, Canada

DEDICATED TO THE PROMOTION OF INTERNATIONAL TRADE BY THE

GOVERNMENT OF CANADA

INTERESTING FACTS ABOUT THE CANADIAN INTERNATIONAL TRADE FAIR

Businessmen from over 70 countries visited the 1948 Fair. More than 1400 exhibits displayed the products of 28 different nations.

●

The Trade Fair site contains the largest permanent exhibition buildings in the world.

●

Canada is the host—but the Trade Fair belongs to the businessmen and traders of every nation.

●

Strictly business is the rule. The general public is admitted only on one Saturday and two Wednesdays during the Fair.

●

The area of the Trade Fair is a Free Port, enabling exhibitors to store adequate quantities of sample goods on the premises in bond.

●

Many special personal services, including guides, interpreters and stenographic facilities, are available to visitors from abroad.

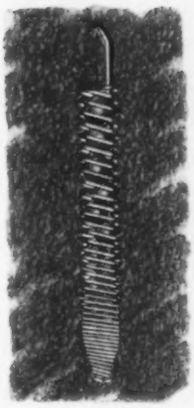
Want Additional Product Information? See Page 19.

FOR BEST RESULTS USE THE

Udylite BRIGHT ZINC PROCESS

COMPLETE STOCKS OF ALL SUPPLIES—HIGH QUALITY PLATING AT LOW COST

Exclusive Ball Anode Container Saves on Salts



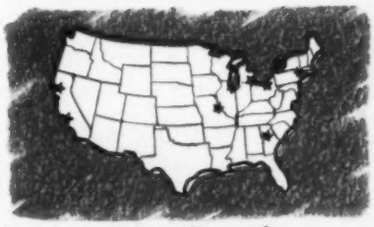
The Udylite Ball Anode Container is specially designed to prevent scrap from dropping to the bottom of the tank. Even the smallest ball anode scraps are kept "in action" until completely used. Thus, the metallic content of the bath is maintained at a uniform level—minimizing costly salt additions.

Udylite Ball Anodes provide a constant, maximum anode area which prevents sludge accumulation. As the anodes are used up, new ones are added at the top.

High-Efficiency Brighteners

Udylite Brightener Agents are highly effective in producing the proper grain refinement for brighter zinc deposits. They are specially prepared to have stability in the plating bath, insuring full effectiveness over a long period. Udylite Brightener Agents are quickly and easily added to the plating bath.

Coast-to-Coast Stocks of Prepared Zinc Salts



Udylite maintains complete stocks of prepared Zinc Salts to fill your needs promptly, and prevent costly delays or process interruptions. Udylite also carries a complete line of platers' supplies—from rubber gloves to anodes, chemicals, and a complete line of plating equipment. All supplies are laboratory tested for your protection.

PIONEER OF A BETTER WAY IN PLATING

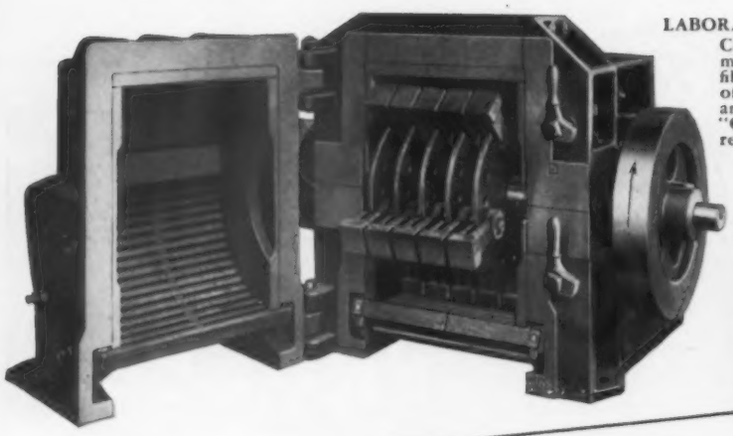
Let Us Help You On Any Plating Problem

Remember, Udylite Technical Men are at your service at all times to help you on any plating problem whatever. There is no obligation or cost. If current shortages have necessitated certain changes in your plating operations, our Technical Staff will be glad to study your processes, and make recommendations for top plating efficiency, excellent finishes, fast output, and minimum plating costs. Just address a letter to us, describing your process, and the results you want . . . and let us furnish you with detailed recommendations. Write *today.*

THE Udylite CORPORATION

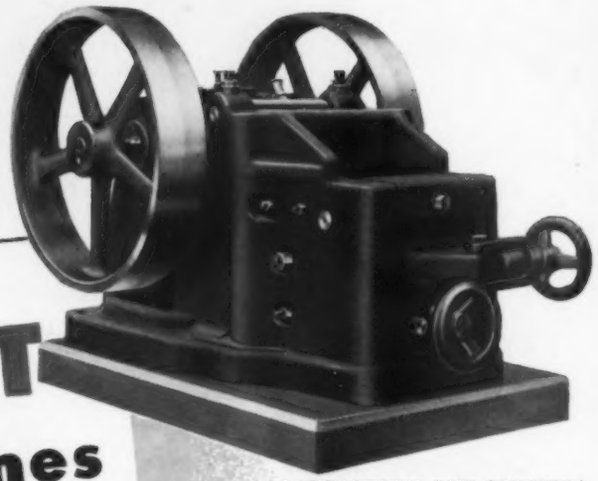
DETROIT 11, MICHIGAN

Want Additional Product Information? See Page 19.



LABORATORY SWING-SLEDGE MILLS

Capable of reducing soft, moderately hard and tough or fibrous materials to any degree of fineness between 1 in. and 20 mesh. The patented "Open-Door" feature permits ready accessibility for cleaning.



STURTEVANT

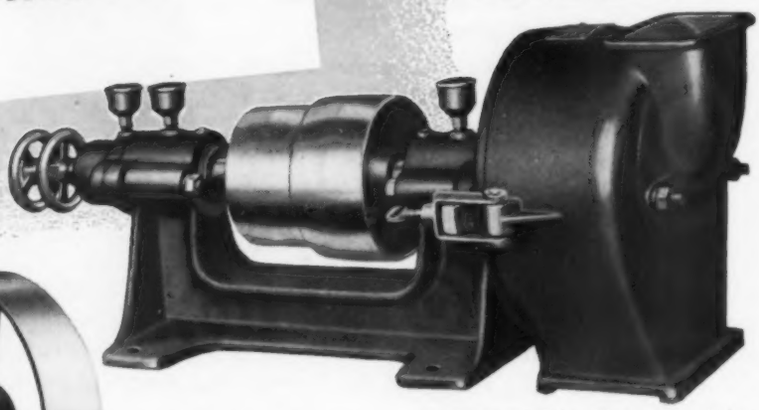
Laboratory Machines

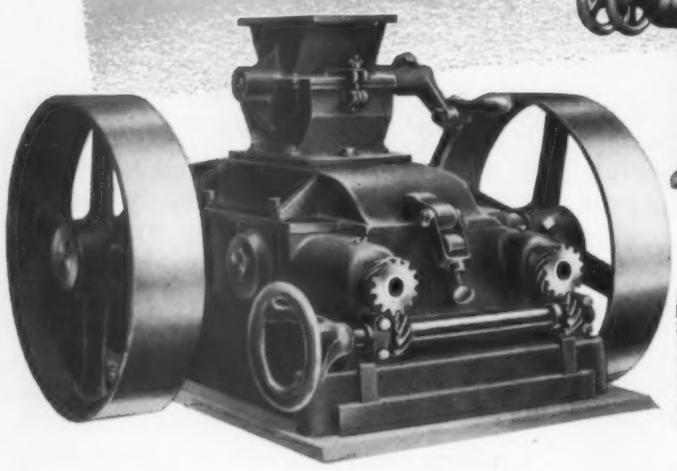
Assure Quality of Products

Fast - Economical - Accurate

LABORATORY JAW CRUSHERS

Special Roll Jaw action simplifies close regulation of the product with capacities varying from 300 or 400 lbs. per hour at finest settings, to 1000 or 2000 lbs. when opened for coarser work. Each part of the crusher is accessible for quick and easy cleaning.





LABORATORY CRUSHING ROLLS

First designed especially for laboratory sampling work, Sturtevant Crushing Rolls are used regularly in many plants where there are limited outputs. Range of output for the 8 x 5 size is from ½ in. to 20 mesh — and for the 12 x 12 size from ¾ in. to 20 mesh.

LABORATORY SAMPLE GRINDER

Laboratory Sample Grinders are of the "Open-Door" disc type and are capable of very fine work, producing products as fine as 100 mesh (coarser if desired) when working on dry, friable, soft or moderately hard materials. Simply turn hand wheel to provide product regulation from 10 to 100 mesh.

The only sure way to maintain strict quality of products is laboratory control . . . and that calls for accurate sampling.

Sturtevant Laboratory Equipment meets the exacting requirements of laboratory work. They are fast and accurate . . . provide true samples.

Rugged and dependable, Sturtevant equipment actually has all the features of full size machines plus extra accuracy and wider range of adjustment. The "Open-Door" accessibility permits quick, thorough cleaning . . . prevents the possibility of previous batches from contaminating new samples.

Investigate Sturtevant equipment for your laboratory. It will cut your sampling costs . . . help maintain strict quality of products . . . increase sales. Write for complete details and catalog.

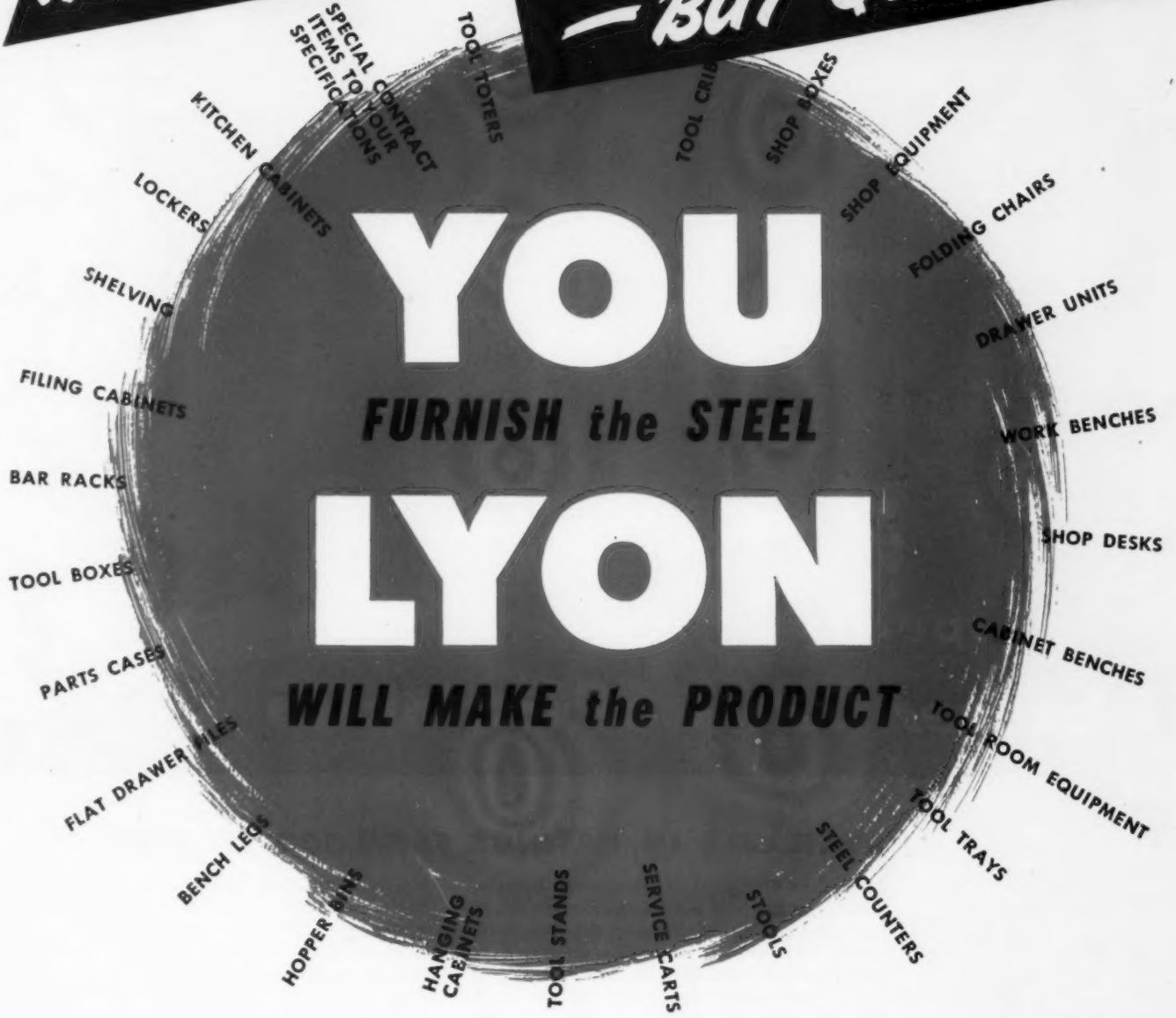
STURTEVANT MILL COMPANY

107 CLAYTON STREET, BOSTON 22, MASS.

Designers and Manufacturers of: CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

Want Additional Product Information? See Page 19.

WHAT DO YOU NEED? —BUT QUICK!



● We buy the steel from you and ship the pound-for-pound equivalent in any selection of LYON products, at regular published prices (see partial list below) or special assemblies, sub-assemblies, parts, etc., for your products—to your specifications.

For complete information about the "customer steel plan" get in touch with your nearest LYON District Office.

LYON METAL PRODUCTS, INCORPORATED

General Offices: 233 Monroe Avenue, Aurora, Illinois
Branches and Dealers in All Principal Cities

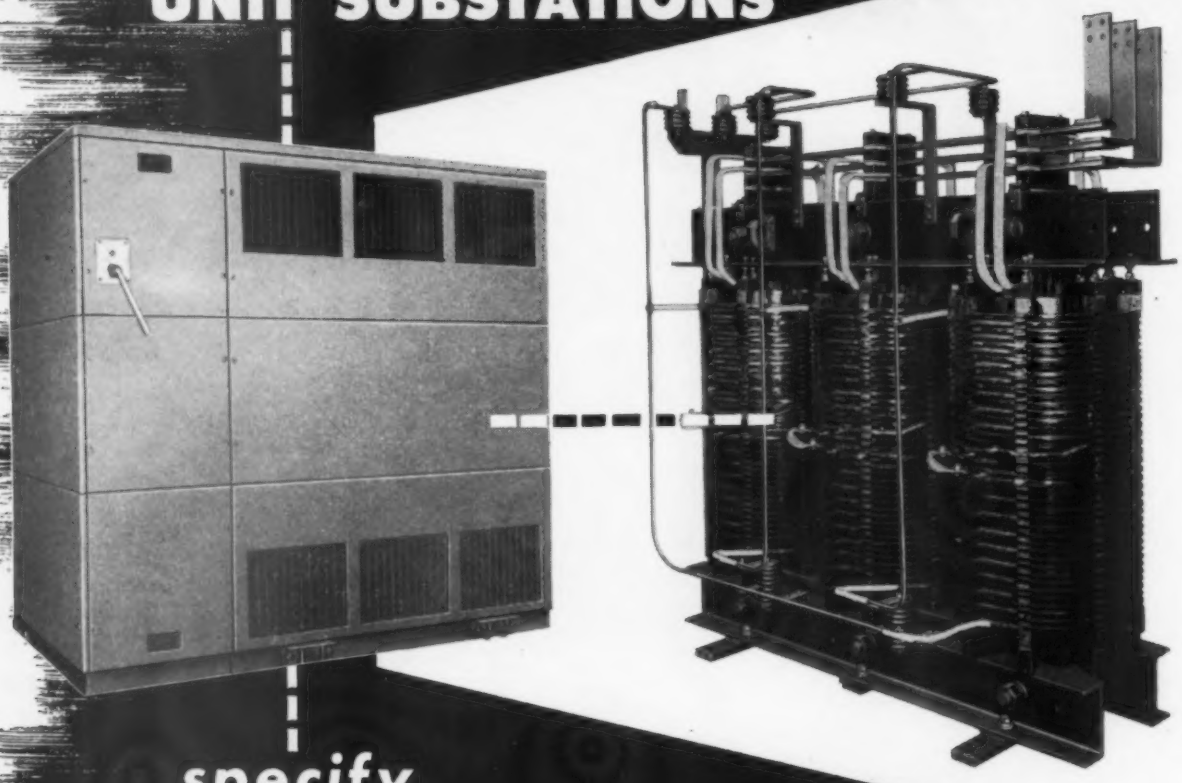
A PARTIAL LIST OF LYON PRODUCTS

• Shelving	• Kitchen Cabinets	• Filing Cabinets	• Storage Cabinets	• Conveyors	• Tool Stands	• Flat Drawer Files	
• Lockers	• Display Equipment	• Cabinet Benches	• Bench Drawers	• Shop Boxes	• Service Carts	• Tool Trays	• Tool Boxes
• Wood Working Benches	• Hanging Cabinets	• Folding Chairs	• Work Benches	• Bar Racks	• Hopper Bins	• Desks	• Sorting Files
• Economy Locker Racks	• Welding Benches	• Drawing Tables	• Drawer Units	• Bin Units	• Parts Cases	• Stools	• Ironing Tables

Want Additional Product Information? See Page 19.

when buying

UNIT SUBSTATIONS



specify

Wagner TRANSFORMERS

AVAILABLE IN RATINGS FROM 100 TO 2000 KVA

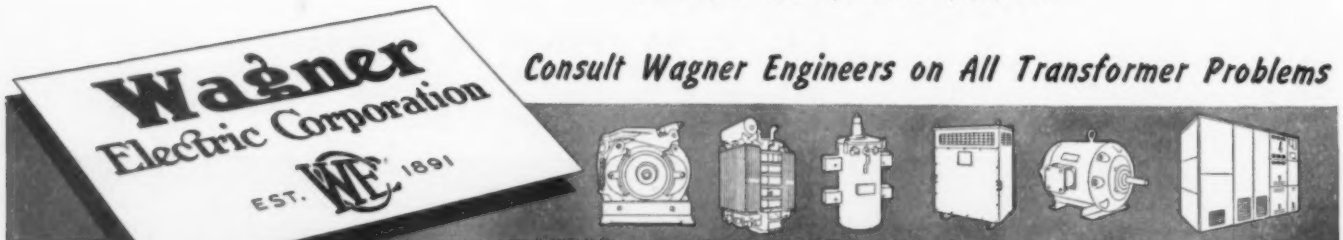
More than fifty years of transformer building experience has been incorporated in the design and construction of Wagner dry-type load-center transformers. Especially developed to meet industry's need for larger transformers for use in plant power distribution circuits, these units are compactly housed in neat, attractive enclosures, which can be arranged to include primary and secondary switchgear compartments to form readily accessible, closely-coupled unit substations. Complete enclosure of all equipment protects against accidental contact with live parts. Relatively light in weight, so they can be used in multi-story buildings, they are readily adaptable to any installation requirement.

Bulletin TU-56 describes in detail the transformers, the enclosures, the various types of incoming line sections available, and the optional equipment and accessories that can be furnished. Write for your copy today.

Wagner Unit Substation Transformers are also available in oil-filled and Noflamol types. Bulletin TU-181 gives information on the complete line of Wagner Power Transformers.

Wagner Electric Corporation
6360 PLYMOUTH AVENUE, ST. LOUIS 14, MO., U. S. A.

Consult Wagner Engineers on All Transformer Problems



BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

T49-3A

ELECTRICAL EQUIPMENT AND AUTOMOTIVE BRAKE PRODUCTS

Want Additional Product Information? See Page 19.

THEY MAY LOOK ALIKE . . . *but there's a difference!*

Mark of Antonius Stradivarius, Cremona, Italy . . . 1719

Mark of distinctive workmanship and quality

While both violins may look alike to the camera's eye, one is a rare instrument the other, a clever copy Actual comparison by a trained musician will show a vast difference in quality and value!

THERE IS A DIFFERENCE IN TAPS, TOO!

All taps may look alike at first glance, but the inherent, built-in quality of BATH ground thread taps is evident by their outstanding, everyday performance. Bath taps are ground from the solid AFTER hardening . . . are available in stock sizes or custom built for special uses.

For instance, if you're having trouble tapping stainless steel, there's a BATH tap, especially ground and engineered to speed production and decrease the threading cost of this hard-to-work metal. Why not investigate this special tap . . . or, write us about your particular threading problem today? Our experience is yours for the asking!

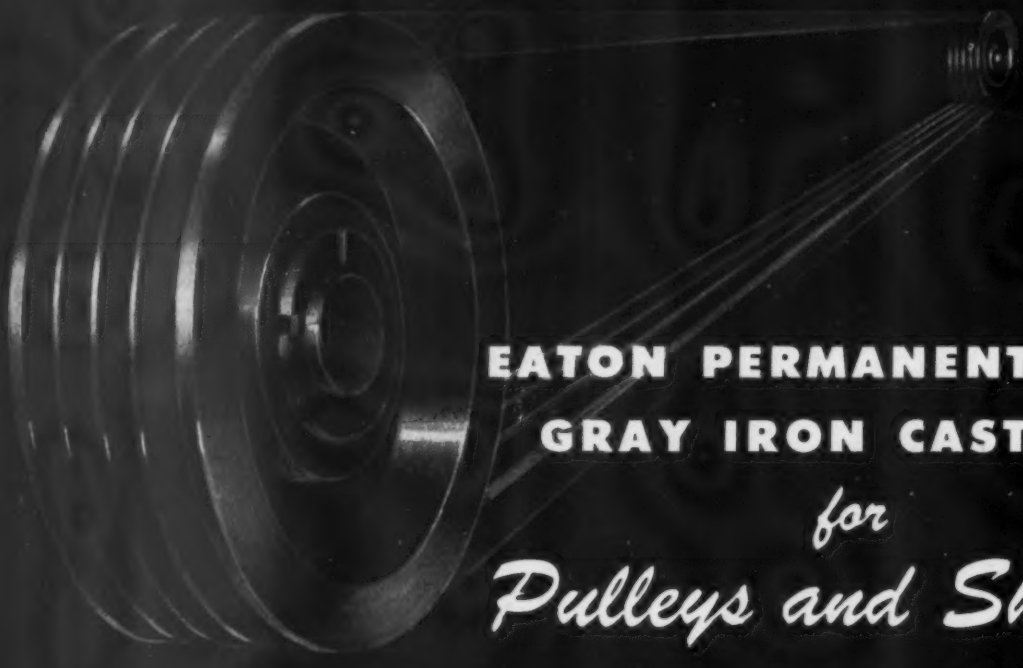
INSIST ON BATH TAPS . . PROFIT BY THEIR PLUS-PERFORMANCE!

PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

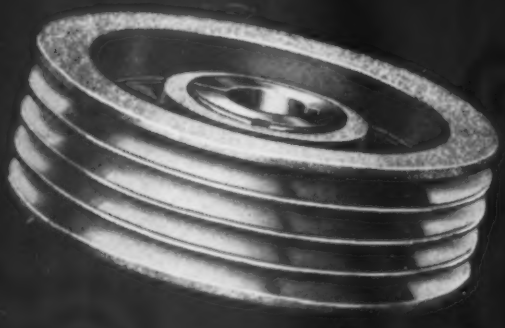
JOHN BATH CO. INCORPORATED

26 Grafton St., Worcester, Mass.

Want Additional Product Information? See Page 19.



EATON PERMANENT MOLD GRAY IRON CASTINGS *for* *Pulleys and Sheaves*



Uniform structure throughout the casting, freedom from growth and segregation, plus good tensile strength and ability to take a high surface finish—these qualities make Eaton Permanent Mold Gray Iron Castings ideal for the production of V-belt pulleys, sheaves, and similar parts. Free machinability makes for maximum production speed and low machining cost.

Eaton Foundry Division engineers will be glad to discuss the application of Eaton Permanent Mold Gray Iron Castings to your product. Send for your copy of the illustrated booklet, "A Quick Picture of the Eaton Permanent Mold Process for Producing Gray Iron Castings".

EATON
MANUFACTURING COMPANY
FOUNDRY DIVISION
9771 French Road · Detroit 13, Michigan

Want Additional Product Information? See Page 19.

If precision is your problem, sleeve bearings will solve it to the fullest extent... in modern aircraft engines and their superchargers—on the spindles of precision machine tools—where precision is paramount—Bunting Cast Bronze sleeve bearings are used... Versatile in design and alloy, Bunting Bearings offer advantages which we would like to discuss with you. The Bunting Brass & Bronze Co., Toledo 9, Ohio. Branches in Principal Cities.

Bunting

BRONZE BEARINGS ☆ BUSHINGS ☆ PRECISION BRONZE BARS

42

Want Additional Product Information? See Page 19.

✓ for STEEL-SHEET PILING
and light-weight, corrugated piling

RAILS and TRACK ACCESSORIES

✓ WRITE
✓ WIRE
✓ PHONE FOSTER

1 TON OR 1000

EVERY SINGLE ITEM AS SHIPPED BY FOSTER IS WARRANTED TO BE REPRESENTED . . . AND IS SUBJECT TO PURCHASERS INSPECTION AND APPROVAL AT DESTINATION.

PROMPT SHIPMENTS FROM FIVE WAREHOUSES
PITTSBURGH; CHICAGO; AMSTERDAM, N. Y; DELAWARE, N. J; HOUSTON, TEXAS

PURCHASERS PLEASE NOTE:

46 years of customer satisfaction are solidly behind Foster Piling, Rails, Track Accessories, Pipe and Wire Rope . . . always sold under the Foster guarantee. Foster's dependable service continues during periods of scarcity. Five strategically located sales offices are ready to serve you.

L. B. FOSTER CO.
PITTSBURGH 30
P. O. Box 1647
Phone WAlnut 3300

NEW YORK 7
11 Park Place
Phone BArclay 7-2110

HOUSTON 2
Electric Building
Phone BEacon 3-9431

CHICAGO 4
231 S. LaSalle Street
Phone CENtral 6757

SAN FRANCISCO 4
315 Montgomery St.
Phone EXbrook 2-3068

ADDRESS THE FOSTER OFFICE NEAREST YOU

F.O.B. filosofy of buying

IN "The Publisher Speaks" column of *Printers Ink*, a leading journal of the merchandising and advertising field, C. B. Larrabee recently told the following story:

"Another salesman . . . was telling me about a purchasing agent who makes it a habit to occupy the same table in the same restaurant every day. By now it is customary for salesmen who do not have a date to drop in at this particular restaurant. If this purchasing agent is not already being courted by a competitor, the salesman sits down and buys the lunch. 'I don't suppose that man has bought himself a lunch in 15 years,' the salesman tells me."

From this and other instances cited, Mr. Larrabee concludes: "I don't suppose there is any moral to these stories beyond the obvious one. Nobody gets a really free lunch. It has to be paid for. The money comes eventually from the customer. I wonder how many customers ever stop to figure that out."

The recurrence of such stories is cyclical evidence of the return of the buyer's market. Remember, only a couple of years ago, it was considered smart and witty to remark that purchasing agents were buying lunches for the salesmen. Mr. Larrabee's P. A., with an unblemished record of 15 years of mooching, is apparently the one man who successfully resisted a basic business trend.

• •

A PROFESSOR of Economics at New York University has developed a series of three-dimensional graphic models which, by the flow of colored liquids, illustrate the operation of various economic laws. Up to the present time, it is used only for classroom demonstrations, but it would seem that a good industrial market could also be developed for a reliable economic comptometer.

• •

EXPERIENCE is a valuable asset in purchasing. A communication from the Washington Association places in nomination as the most experienced active, on-the-job purchasing agent in the United States its good member, A. C. "Pop" Reinhardt of the Peterson Wholesale Hardware Company, Seattle. "Pop" is a spry 88, and is just completing his 70th year in the hardware business. That long service record has been compiled with just three firms. He started in 1879 with the Simmons Hardware Company of St. Louis, came to Seattle in 1913 with the Seattle Hardware Company, and fourteen years ago, as a youngster of 75, took over the purchasing job for the Peterson organization. He is a regular and interested attendant at Association meetings, having an attendance record of 70% for the past two years. Can anyone top this record? Can anyone come close to it?

• •

THE sprightly house organ, *Trumbull Cheer* (The Trumbull Electric Mfg. Co., Plainville, Conn.), publishes a story illustrating one form of pricing policy. We quote:

A gentleman in the optical business was instructing his son in the technique of edging a fair and honest price out of a customer. He said: "Son, after you have fitted glasses to a customer and the customer asks, 'What's the charge?' you say, 'The charge is ten dollars.'

"Then you pause, and watch for the flinch. If the customer doesn't flinch, you say, 'That's for the frames; the lenses will be another ten dollars.'

"Then you pause again—but this time just slightly—and again you watch for the flinch. If the customer doesn't flinch — you say, 'each'."

• •

AN interesting sidelight on the business situation is provided in the statement made by John M. MacDonald, management engineer specializing in the brokerage of business enterprises, that there were twice as many businesses put up for sale in 1948 than in 1947, and far fewer buyers. It is his further pre-

Want Additional Product Information? See Page 19.

diction that the next two years will see more such offers and more mergers than have occurred in the past ten years. The trend is not confined to marginal concerns, and the range of offerings runs all the way from a department store doing $4 million of business annually to a small saw mill. Most active buying interest is shown for companies having a new and unique product, patent rights, or favorable access to scarce materials. For some time past, the largest classifications up for sale have been in luxury lines and cotton textiles, but the metal trades and small parts manufacturers are expected to be the next large group to join the trend.

• •

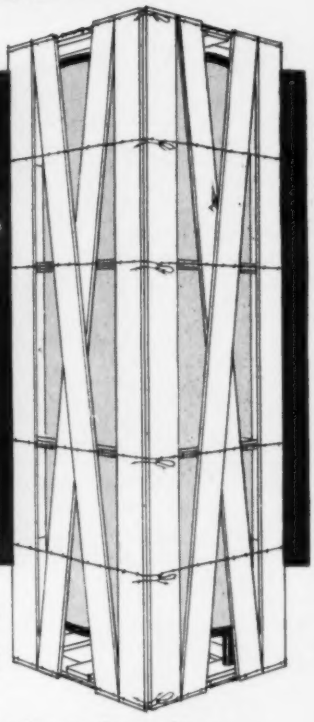
THE ultimate in curb service has been found by City P. A. Willard V. Pape of Seattle. Seeking bids on 300 parking meters, Mr. Pape was offered one model that incorporates an attachment for street-side payment of fines for minor traffic violations, stamping and tearing off a stub of the traffic ticket, and thus eliminating the bother of having to appear in person at the City Hall or elsewhere to pay the fine.

• •

PROGRAM directors and featured performers in the entertainment world are giving a good deal of thought these days to the changing techniques entailed by the rapid development of television, which reaches its audience through the medium of two senses—sound plus sight—instead of radio's single sense. The situation parallels the problems of the motion picture industry some years ago, when sound was added to sight. As in that former experience, it is expected that some popular and well established stars will fall by the wayside while new performers with "television personality" will rise in popular acclaim. Meanwhile the sponsors and telecasters are considering what the change will mean in terms of the techniques of the sponsors' "commercials". Consensus is that this part of the program will change from advertising to actual selling—that more direct results will be demanded, and made possible. Traditionally, the salesman's first job was to get his foot in the door. Now he finds himself right in the living room, as a part of the family circle, with his samples spread out on display.

General ★★★★★ *Product Protection*

Helps keep your customers satisfied ...Helps keep your customers!



No dents—No chips—No scratches
. . . and No costly complaints!

Porcelain enameled products, highly finished wood products . . . products of all kinds get positive protection—inside and outside—when packed in General Engineered Shipping Containers. And, here's why:

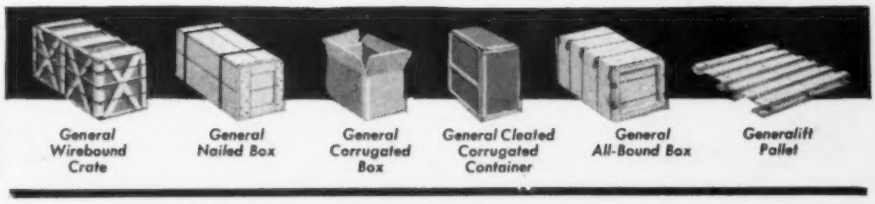
General Boxes are laboratory-designed *to the specific product.* This means that they are also lightweight, compact, and extra strong. They are easy to assemble quickly—frequently right on your production line.

Our engineers will be glad to help cut your packing and shipping costs. Write for facts today. Also send for *your* copy of THE GENERAL BOX.

Our two Designing and Testing Laboratories are available for the improved packing of your products. They are equipped with the most modern testing apparatus and staffed by experts with many years of experience in designing more efficient shipping containers.

General ★★★★★ *BOX COMPANY ... engineered shipping containers*

GENERAL OFFICES: 48 W. Illinois St., Chicago 10.
DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon, Natchez.
Continental Box Company, Inc.: Houston, Dallas.



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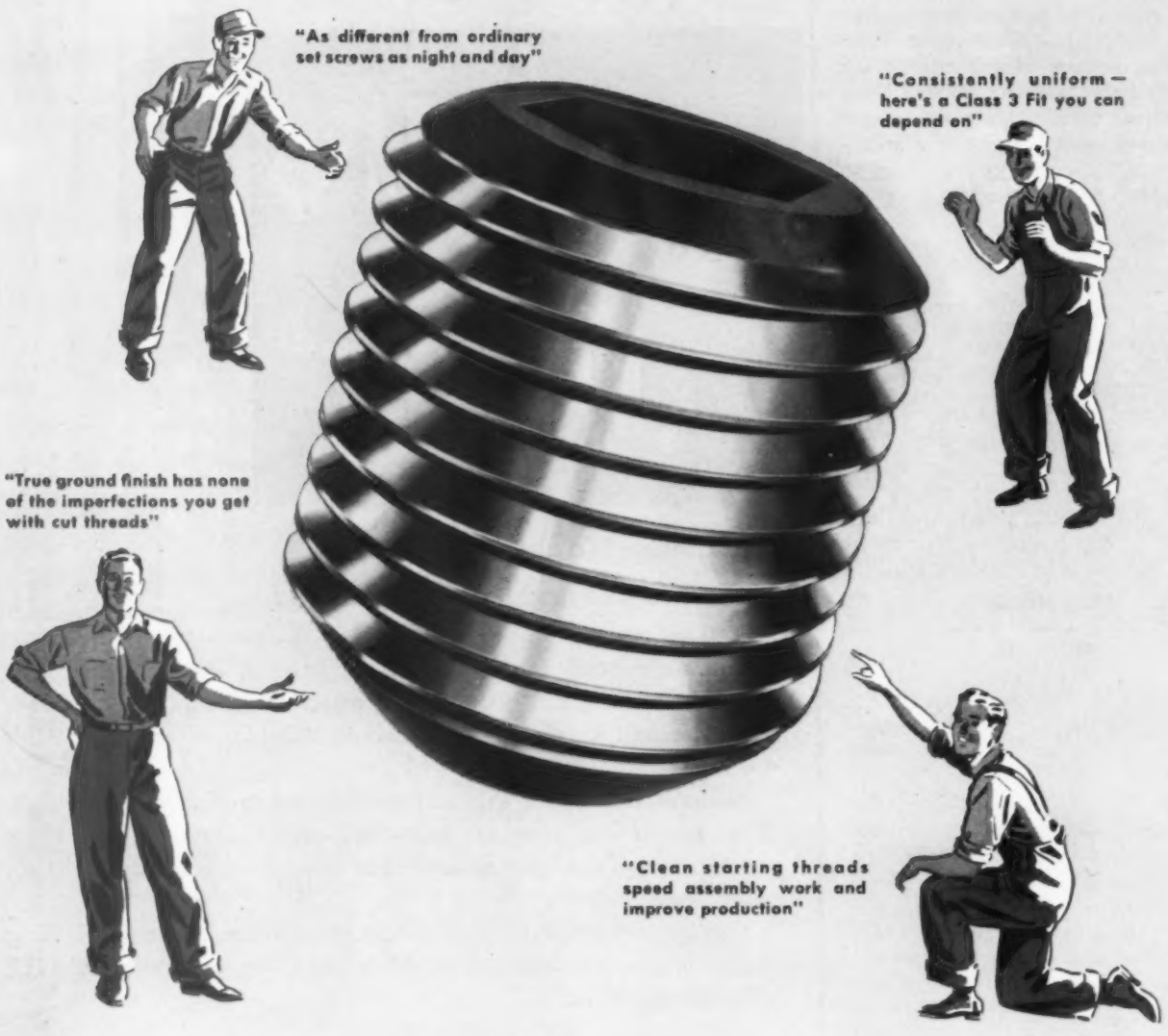
Parker-Kalon GROUND THREAD Socket Set Screws are The TALK of the SHOP!


"As different from ordinary set screws as night and day"
"Consistently uniform — here's a Class 3 Fit you can depend on"
"True ground finish has none of the imperfections you get with cut threads"
"Clean starting threads speed assembly work and improve production"

Compare! Write for Samples!

See why P-K Ground Thread Socket Set Screws speed assemblies, improve strength and safety. Thread grinding, once reserved for screws used in the finest precision equipment, now gives Parker-Kalon Socket Set Screws the accurate finish and faultless contour that mean faster assembly and more sales for your products. Write for samples today.

AVAILABLE FOR PROMPT DELIVERY

PARKER-KALON CORPORATION
200 Varick Street
New York 14, N. Y.

SOLD ONLY THROUGH ACCREDITED DISTRIBUTORS

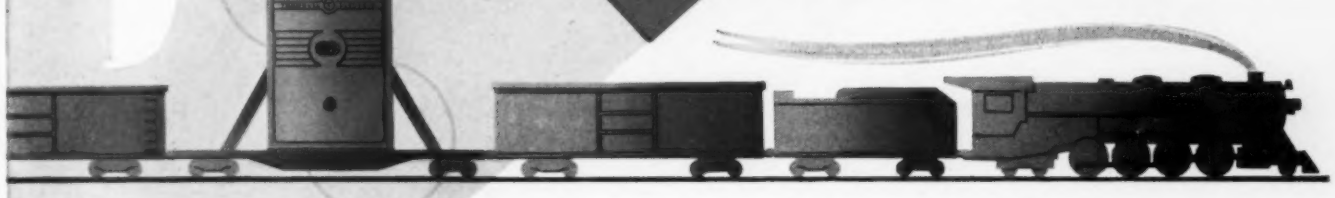
Want Additional Product Information? See Page 19.

HERE COMES THE

Trumbull Train

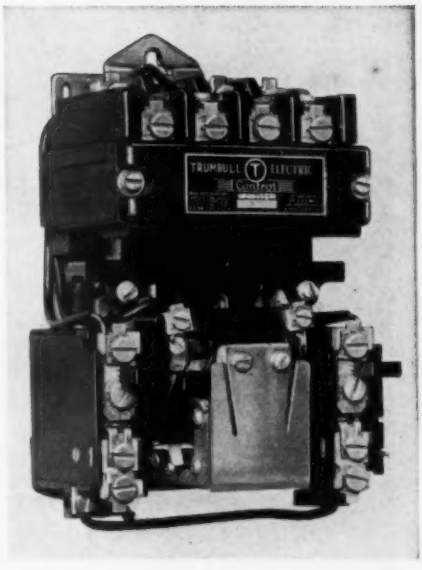
OF ELECTRICAL PROGRESS

A whole parade of new Trumbull products is headed your way! A new advancement in the entire line of Trumbull products — Flex-A-Power systems, Panel Boards, Control Centers, Switches and Motor Starters — all radically different. So watch for Trumbull's new product announcements during 1949. Here's the first —



A NEW

Magnetic Motor Starter and Magnetic Contactor



New, from top to bottom, Trumbull Starters and Contactors in sizes 0, 1, 2, 3 give maximum protection to motors up to 50 hp, 440 v. Look at all their important new advantages:

LONGER CONTACT LIFE —
Actual factory tests show the silver contacts on the Trumbull starter "make and break" for millions of operations — many times more than any starter on the market.

EASY TO MAINTAIN —
Silver contacts have permanently attached springs that are easy to remove. Terminals are located on the front and are easy to wire — a screw driver is all you need to disassemble starter — can be accomplished in less than a minute.

EASY TO INSTALL AND SERVICE —
Note convenient knockouts, large terminals, front connections, and ample wiring space.

GREATER PROTECTION —
Bi-metallic relay heaters follow motor's heating curve. Easily adjusted for automatic or manual reset.

BUILT TO LAST —
All parts resist corrosion and moisture. Examine plastic coil enclosure to see how the tough varnish impregnation protects windings. Contact points and cold-molded asbestos arc hood eliminate arcing . . . give clean "make and break" contact.

QUIET OPERATION —
Permanent lubricant impregnated in the plastic coil enclosure keeps magnet guides sliding smoothly . . . eliminates low voltage "chatter."

FOR MORE INFORMATION about this latest Trumbull development, write for Circular TEC 11. THE TRUMBULL ELECTRIC MANUFACTURING CO., Plainville, Conn. Other factories and offices throughout the United States. Foreign representation.

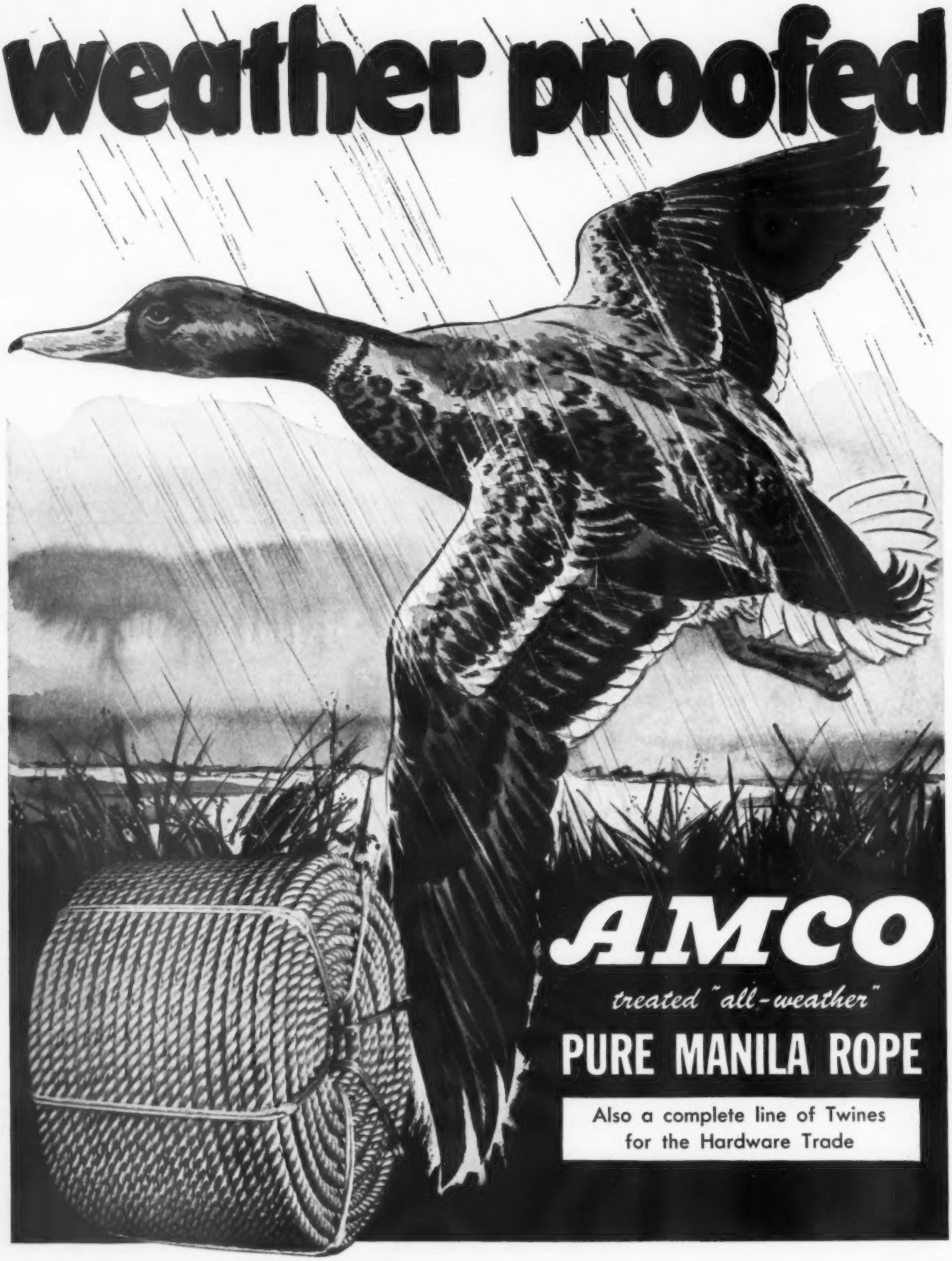
Men Who Observe the Best Electrical Practice Make It a Practice to Use

TRUMBULL (T) ELECTRIC

TRUMBULL'S TRAINLOAD OF NEW PRODUCTS

Want Additional Product Information? See Page 19.

weather proofed



AMCO

treated "all-weather"

PURE MANILA ROPE

Also a complete line of Twines
for the Hardware Trade

AMERICAN MANUFACTURING COMPANY, BROOKLYN 22, N. Y. • ROPE • TWINE • OAKUM • PACKING

Branch Factory: **ST. LOUIS CORDAGE MILLS, ST. LOUIS 4, MO.**

Sales Offices: BOSTON • CHICAGO • HOUSTON • NEW ORLEANS • PHILADELPHIA

Want Additional Product Information? See Page 19.

Purchasing Previews

A Washington Report . . . . . for Purchasing Agents

February 1, 1949

INDUSTRY TOLD TO EXPAND PRODUCTION . . . .

President Truman's plan to keep the U. S. economy on a consistently high plateau is now unfolding. Behind it is the thinking that the business cycle is man-made, and therefore can be sustained at a high level if properly managed.

The part that business should play is to remain constantly optimistic---to plan for steady, vigorous expansion, seeking always to increase its output, lower its prices and avoid monopoly.

Government's function is to protect both business and the people against the dangers of recessions and the evils of inflations. This means that while business goes ahead on a constant note of optimism, Government will go out ahead and break ground for the new road to constant prosperity.

If business cannot sustain this pollyannish pace,the Government will goad it on until optimism becomes a habit. An example of the method to be employed is cited in the instance of steel production.

There has been considerable controversy about the tonnage of steel that should be produced. Currently, the supplies of steel are less than demand, even though the steel industry increased its capacity during and since the war.

One economist has projected a study that to provide full employment in the period ahead, there will have to be more steel produced. The steel industry, on the other hand, has been less blithe in its approach, recalling the glut of steel following the post-World War I demand flurry.

Result until now is that the steel industry has sought to compromise by expanding with some regard for caution.

Now President Truman drops the heavy hint that unless the steel industry is willing to expand---using either its own funds for new plant or by borrowings from the Government, the Government itself will build steel plants.

This suggestion applies also to producers of other materials in critically short supply.

MATERIAL SHORTAGES LESS PRONOUNCED . . . .

Government reports show an easing in supply of many of the critically short materials which have slowed production since the war.

United States stocks of tin showed a gradual upward trend, according to a Department of Commerce report. Similar reports have been made covering a number of other materials.

These reports have been held by industry observers to mean an end to the seller's market, and a return to normal buyer-seller relationships. With this return to normalcy, it has been generally felt that there will be a lessening of Government intervention in trade and distribution of materials and goods.

Government spokesmen, however, take an entirely different view of what is likely to happen. Whether it is anticipated

that the rearming of Western allies, or perhaps some other commitment will create even further shortages, the President calls for additional powers to be vested in Government.

Among the powers that the President wants the Government to retain or extend, there is the authority to control exports, and provisions for adequate machinery for enforcement of these controls; priorities and allocations in the field of transportation; priorities and allocations of key materials in short supply; and standby authority to impose price ceilings for scarce commodities which basically affect essential industrial production or the cost of living.

Along with the price control powers, the President suggests that he be given power to fix wage ceilings in industries where increases would force a break in any price ceilings which are established.

PRICE CLASH AFFECTS MARKETING . . . .

Continued rounds of wage increases in the railroad industry have required compensating freight rate increases to a point where transportation rates have become an increasing factor in marketing costs.

These developments have been highlighted in several recent instances where agricultural produce shipped to eastern markets has brought such small returns because of temporary market gluts that their selling price hardly covered the actual freight charges.

The Government program guaranteeing the farmer a support price for his crops makes it possible for the farmer to avoid such losses, but the increasing freight rates pose an interesting problem, with the possibility that agricultural produce will not be shipped to consuming urban areas because, while the grower is protected, the margin represented by the shipping costs represents a larger element of business risk than the grower is willing to take.

While the effect of higher transportation charges can be dramatized as applied to agricultural produce, the application is as specific when applied to industrial shipments.

"ADMINISTERED-PRICE INDUSTRY" UNDER STUDY . . . .

The President's Council of Economic Advisers has suggested that the Sherman Anti-Trust Act was adequate to insure competition in industry in the early 1900's, but that now the problem is no longer one of preventing a number of small producers from collaborating to fix prices.

Premise now is that in an increasing number of industries, business is dominated by a small number of producers, all of whom are interested in maintaining a satisfactory market price and will regulate their production toward that end.

In its Third Annual Report to the President, the Council of Economic Advisers maintains that where three or four firms control more than two-thirds of an industry, there is little price competition. The report asserts:

"Each manager of a major firm knows that each of the others is similarly concerned to maintain a satisfactory market price and will rate his production to that end. The industry has an historical pattern of the share of the business to be enjoyed by each of the leaders, and each manager keeps within that pattern while adjusting his production to changes in demand. Each is confident that the one thing his nominal competitor will not do is to cut price in order to maintain production and sales."

According to the White House economic advisers, this lack of competition will show up sharply in the event of a recession. Idea is that downward adjustments in rate of production to support price levels will mean mass layoffs of workers and set off depression spiral.

The report of the President's Council of Economic Advisers lays the groundwork for blaming any future recession on big business.

Packaging Materials Cost Slashed

Acme-Morrison Silverstitchers helped make savings of 600% in cost of packaging materials—with increased production in 30% less time

ONE OF THE MACHINES THAT DID IT! An Acme-Morrison Silverstitcher on the job, cutting costs for this fabricator of aluminum.

Excellent results were obtained when B & T Metals Company, Columbus, Ohio, installed Silverstitchers to help package buffed and polished aluminum extruded shapes.

Here are the outstanding facts from this actual case study:

1. **Materials saving—600%. Cost of staples cut 35 cents per thousand.**
2. **Time saving—30%.**
3. **Increased production because of ease of operation, greater efficiency, and less maintenance with Acme-Morrison Silverstitchers.**
4. **Stronger, better-quality packaging for improved handling, better "arrival condition," greater customer satisfaction.**

An Acme Shipping Specialist helped get these results. Acme is ready and willing to work with you on better, more economical packaging for your product in corrugated, solid fibre or special containers. Call the district office nearest you, or mail the coupon for more information.

STITCHING WIRE DIVISION

ACME STEEL COMPANY

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 11

ACME & MORRISON
Silverstitchers
REG. U. S. PAT. OFF.
AND SILVERSTITCH BOX-STITCHING WIRE

Acme Steel Company, Dept. P-29
2838 Archer Avenue, Chicago 8, Illinois

Gentlemen: Please send me your free booklet describing Acme Silverstitchers.

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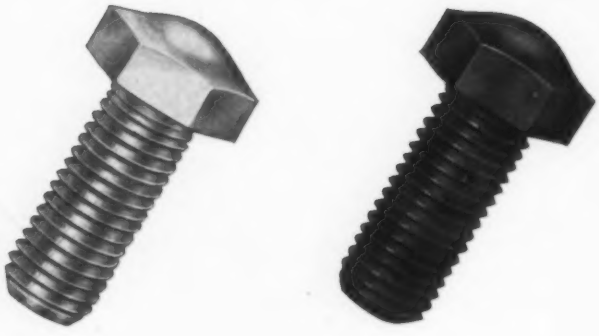
Announcing the New Look by FERRY CAP

CROWNED HEADS



SHINYCROWNS

The King of Hex Heads

For General Use

SHINYCROWNS are designed to give that "New Look" to assembly where eye appeal, appearance, ultra-quality, and sales interest are paramount. For that "finishing touch" to your assembly, specify SHINYCROWNS to secure *beauty with service,* the last word in ornamental Hex Head design.

SHINYCROWNS are furnished in material C-1018 steel, in sizes 1/4" diameter through 1/2" diameter inclusive, in both coarse and fine threads, in these attractive finishes—plain, zinc, cadmium, nickel or chrome plate. Price governed by quantity desired—Bulk shipments only.

SPECIAL NOTE: Also furnished with polished crown to secure highest possible luster, mirror finish.

For Special Use

SHINYCROWNS-HexHard are especially designed with that "New Look" for decorative appearance with the added features of *hard* Hex Heads and soft, tough threads secured by a special heat treatment for use where tightening and loosening for adjustment purposes is necessary.

SHINYCROWNS-HexHard are furnished in special heat treating material to secure the above features, in standard sizes 1/4" diameter through 1/2" diameter inclusive, in both coarse and fine threads, in these attractive finishes—plain, zinc, cadmium, nickel or chrome plate. Price governed by quantity desired—Bulk shipments only.

SPECIAL NOTE: Also furnished in 3/8" diameter special 20 thread where specified.

SHINYCROWNS-HexHard with hard Hex. Heads are recommended to eliminate poor wrench fit resulting in rounded corners from constant adjustment.

Complete Information and Samples furnished on request.

The FERRY CAP & SET SCREW Co.

2165 SCRANTON ROAD • • • • • CLEVELAND 13, OHIO

CAP AND SET SCREWS • CONNECTING ROD BOLTS • MAIN BEARING BOLTS • SPRING BOLTS AND SHACKLE BOLTS • HARDENED AND GROUND BOLTS • SPECIAL ALLOY STEEL SCREWS • VALVE TAPPET ADJUSTING SCREWS • AIRCRAFT ENGINE STUDS • ALLOY STEEL AND COMMERCIAL STUDS • FERRY PATENTED ACORN NUTS

Want Additional Product Information? See Page 19.

AS NEAR AS YOUR TELEPHONE

A new V-Belt service by Dayton, to save you time and money three ways:

1. "Drive Proved" V-Belts—the right belt for your particular drive. For Dayton has made more than 100 million V-Belts. They have been "Drive Proved" in every kind of industry, under every possible operating condition of heat, cold, dirt, dust and oil. They have proved their ability to save space; provide positive power; start and stop smoothly; run quietly, without vibration and last longer than any ordinary belt.

2. As Near as Your Telephone. There is a Dayton V-Belt Distributor near you. He is equipped with the specialized knowledge to recommend the right drive for you. You'll find him listed in the classified section of your telephone directory or his representative is now calling at your plant.

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Put this new service to work in your plant now. Equip your drives with Dayton "Drive Proved" V-Belts and be sure you are getting the maximum in drive performance and service. Call your Dayton V-Belt Distributor today. *The Dayton Rubber Company, Dayton, Ohio.*

ONLY Dayton V-Belts are "DRIVE PROVED" for the Job!

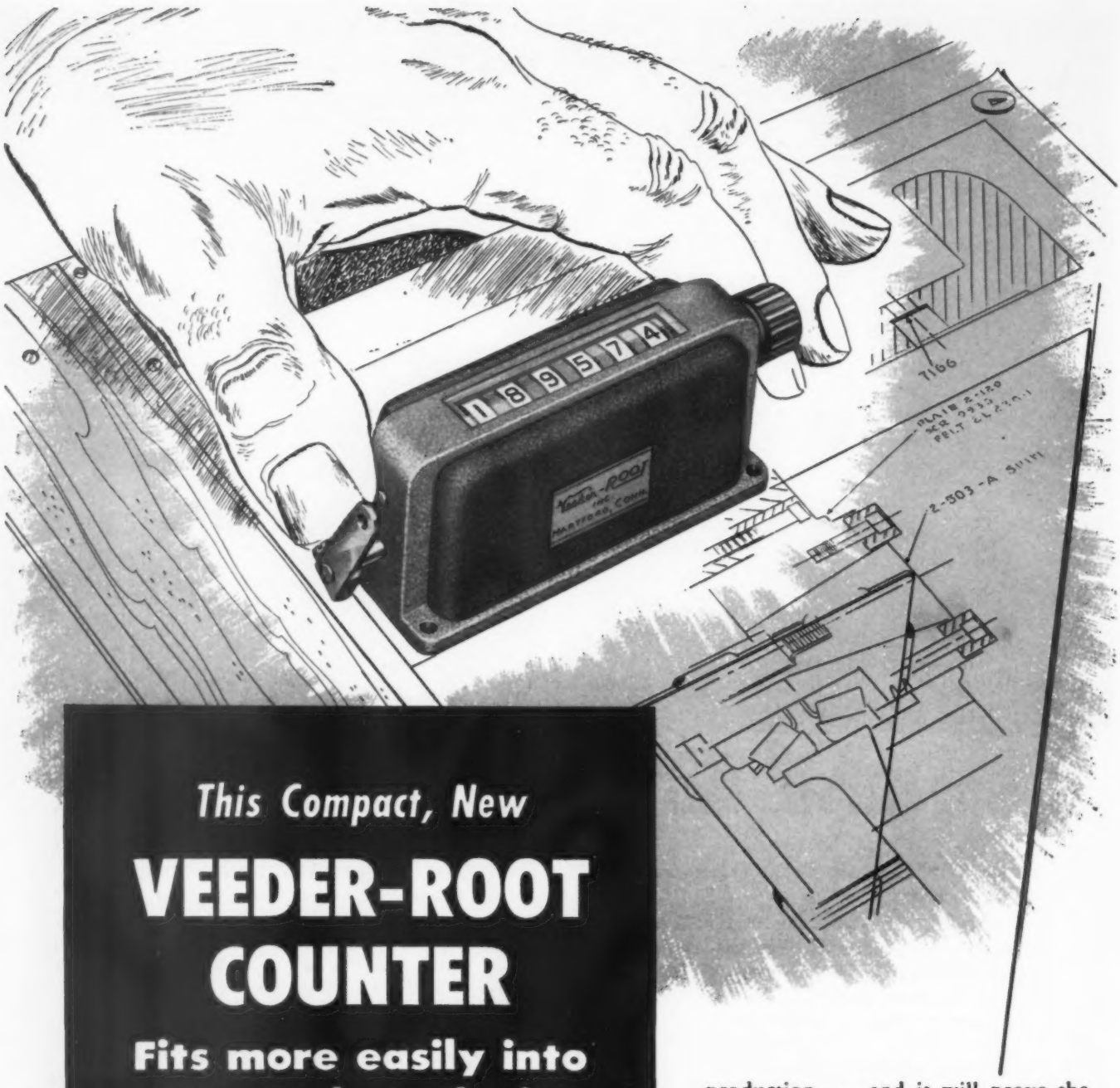
Dayton Thorobred—for normal and heavy duty drives.
Dayton FHP—for small machines and appliances.
Dayton Cog—for shortest centers, smallest pulleys.
Dayton Steel Cable—for extreme loads and speeds.

ALL STOCKED BY YOUR LOCAL DAYTON V-BELT DISTRIBUTOR

Dayton Rubber

THE MARK OF TECHNICAL EXCELLENCE IN NATURAL AND SYNTHETIC RUBBER

Want Additional Product Information? See Page 19.



This Compact, New

VEEDER-ROOT COUNTER

Fits more easily into any product-design

Trim and slim as a fine timepiece . . . and even easier to read . . . this new general-purpose Series 1260 is the most important news in counters since the Veeder-Root bicycle cyclometer of 1868!

This eye-catching counter, richly finished in 2-tone grey to set off the "Ease-Eye" direct-reading line of 6 bold figures, will measurably add to the *appearance* . . . to the *utility* . . . and to the *marketability* of any machine or product into which it is built as an integral part. It will deliver continuous *Facts in Figures* on any phase of operation or production . . . and it will prove the product's guarantee.

And the new 1260 will fit into the closest design-limitations. For it measures only 4½" long, 1 9/16" high, 1½" wide . . . weighs only 12 ounces. Speeds from 1,000 to 5,000 counts per minute, depending on type of drive: ratchet, revolution, direct, or geared. Capacity is 1,000,000 counts. Then one turn of the knob resets to all zeros.

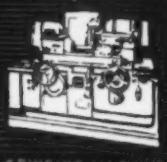
Look for this good-looking modern counter in the new machines and equipment you buy. And, by all means, look into its possibilities as a built-in *sales-builder for your own products.* Write.

VEEDER-ROOT INC.
Hartford 2, Connecticut

In Canada: Veeder-Root of Canada, Ltd., 995 St. James Street, Montreal 3. *In Great Britain:* Veeder-Root Ltd., Kilspindie Road, Dundee, Scotland

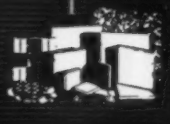
Want Additional Product Information? See Page 19.

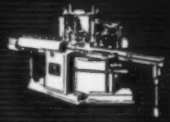
GRINDING WHEELS


GRINDING MACHINES

REFRACTORIES

NORBIDE


NON-SLIP FLOORS


LABELING MACHINES

ABRASIVE PAPER AND CLOTH • • • SHARPENING STONES

Introducing . . .

NORTON

a continuing symbol of
NORTON QUALITY

. . . the same wide variety of products . . . backed by the same extensive research . . . backed by the same manufacturing skill in a modernized plant—now marked by a modernized version of the familiar Norton trade-mark.

Every Norton product—from Worcester as well as from the Behr-Manning division at Troy—will bear this symbol of Norton quality.

The main Worcester plant of Norton Company—world's largest producer of abrasive products

NORTON COMPANY • WORCESTER 6, MASS.

(Behr-Manning, Troy, N. Y. is a Norton Division)

Want Additional Product Information? See Page 19.

MORE PLANTS BUY *Angelica* UNIFORMS THAN EVER BEFORE

BECAUSE OF THEIR

TAILORING

In utility uniforms good appearance is what you *see*. The unseen plus value is their fine Angelica Tailoring that keeps their good looks built in. Every detail, every point of wear has been tailored to withstand the hardest types of service. Well tailored shirts with non-rip sleeve facings; full cut pants with extra strong banding and pocket lining . . . reinforced crotch with all seam edges bound. They'll keep their new look through countless launderings.

Angelica® JACKET CO.

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107 W. 48th, New York 19
177 N. Michigan, Chicago 1
1101 S. Main, Los Angeles 15

Sales Rooms:
124 Stanwix, Pittsburgh 22
1120 Walnut, Philadelphia 7
350 Ellis, San Francisco 2
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WRITE TODAY FOR YOUR ANGELICA UNIFORM CATALOG

ANGELICA JACKET COMPANY
1490 OLIVE ST., ST. LOUIS 3, MO.

☐ Please send me your FREE uniform catalog.
☐ Please have your representative call.

NAME..... TITLE.....
COMPANY.....
ADDRESS.....
CITY..... ZONE..... STATE.....

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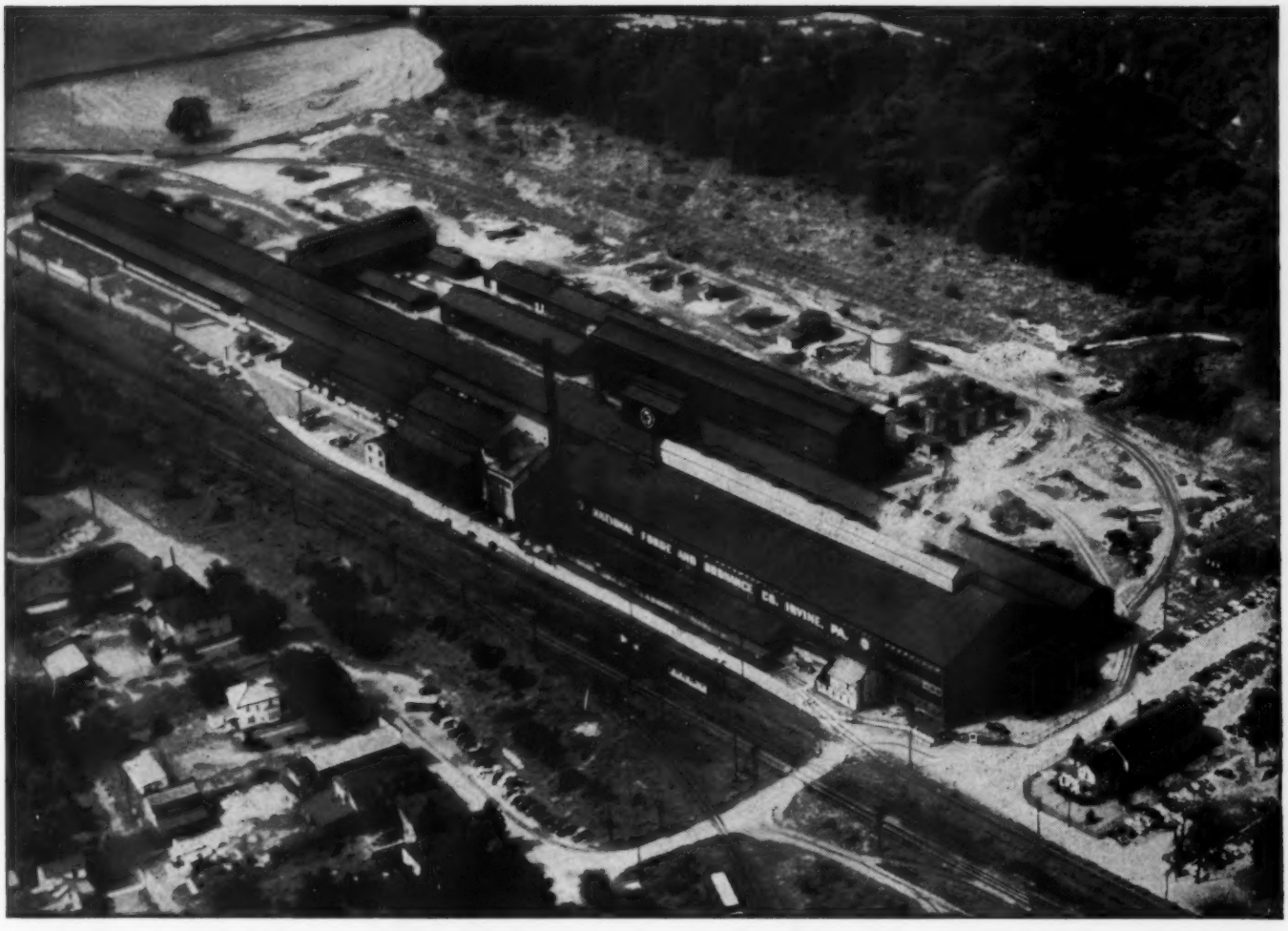


THIS IS THE BACKGROUND FOR BETTER FORGINGS IN 1949

The great scarcity in today's market of many raw materials and products, makes it most essential that everything be made of the best. We should not take chances by using inferior materials. This speaks for steel forgings particularly, because one of the critically scarce materials today is steel. We must conserve it, and one way to do that is to use forgings which will stand up and give continued service under the stress and strain of constant daily use.

In the plant pictured above the National Forge and Ordnance Company makes better forgings. Backed by years of experience, with equipment that is up to date in every respect, a skilled personnel turns out a product which has taken a well deserved place in the productive activity of this country.

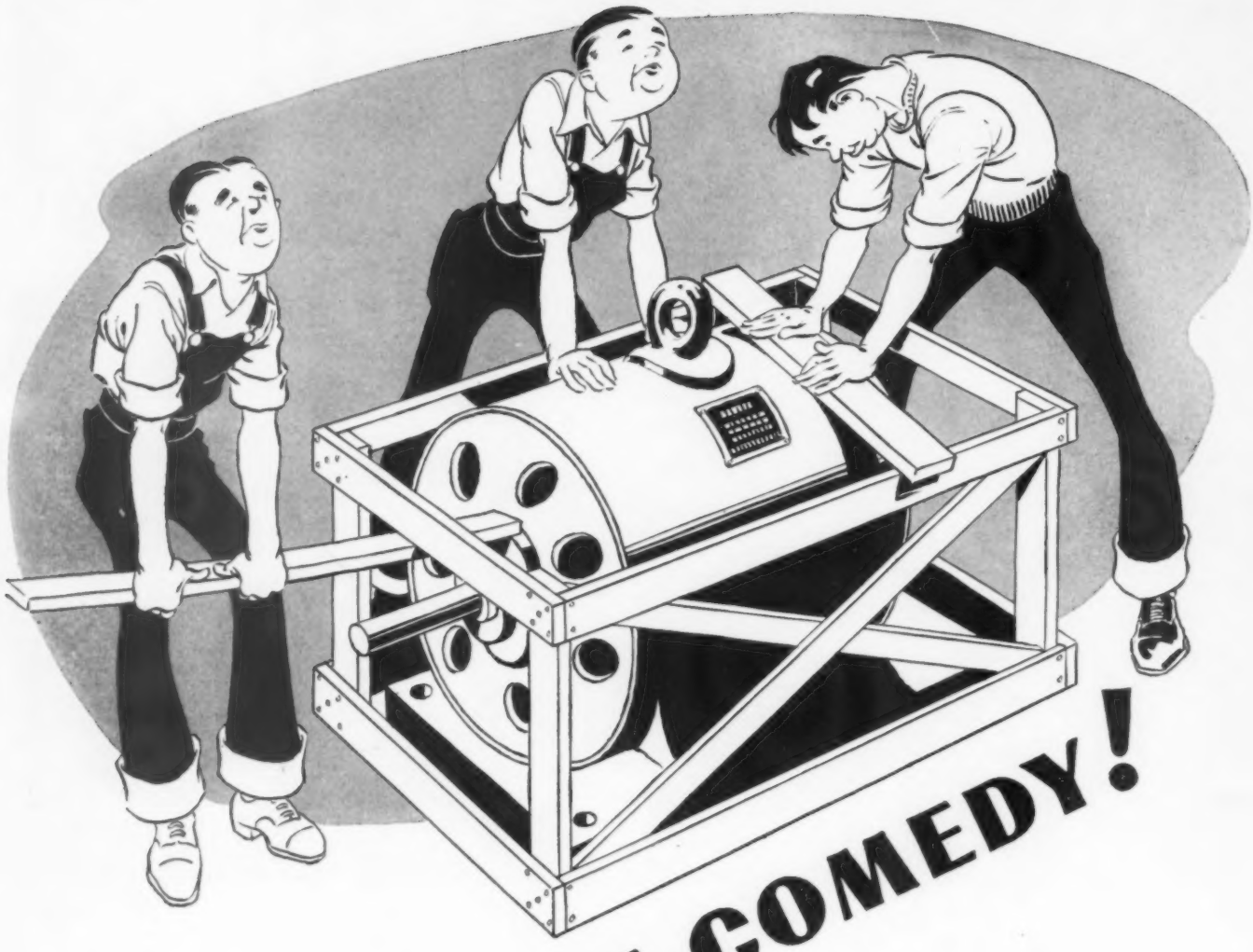
The product is thoroughly controlled from start to finish. The steel used is made in Basic Electric Melting Furnaces located under the long ventilating louvre at the right of the picture. From that point it is forged, heat treated, and machined as it passes through the shop toward the left.

A better product can only be produced when it is made by men who possess the proper know-how and its production is supervised to assure that it receives every deserved attention. This is true of any product, and it is especially true of a steel forging.

The importance of the steel forgings you use, therefore, makes it advisable that you know, in detail, how well National Forge can serve you in the year ahead. The better your forgings, the better your product.

NATIONAL FORGE & ORDNANCE COMPANY, IRVINE, WARREN COUNTY, PA.

Want Additional Product Information? See Page 19.



CUT OUT THE COMEDY!

You don't have to ruin a good product with a bad shipping container. We have men who get paid for designing and constructing boxes and crates that will fit your product.

There must be a reason why so many large corporations have long used SUPERSTRONGS — "Bound with Steel." There is, and we'd like to tell you about it! Write us — NOW — while you're in a mood for increased shipping efficiency at decreased cost.

SHIPPING TRADE SUPERSTRONG MARK CONTAINERS REG. U.S. PAT. OFF.

RATHBORNE, HAIR AND RIDGWAY COMPANY
1440 WEST 21st PLACE • CHICAGO 8, ILLINOIS

Want Additional Product Information? See Page 19.

for SOCKET SETS . . .

BETTER BUY BILLINGS

BECAUSE

THE RATCHET—1/2" Square Drive

MECHANISM DESIGN — Billings ratchet pawl meets the tooth of the ratchet wheel at a 90° angle — direct transmission of power (see diagram above).

STRENGTH — Tests have proven that the Billings safety factor will allow the ratchet to take a pull in excess of the 4800 inch pounds required by U. S. Gov. Spec. No. 41-W-10 (INT). This does not have any effect on the operating mechanism.

PERFORMANCE — A minimum of moving parts eliminates slipping, skidding and jamming. The user's effort is transmitted directly to the driver.

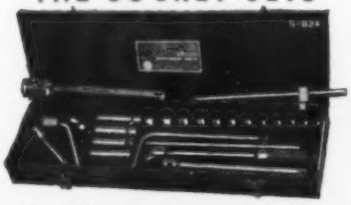
WEIGHT — One of the lightest on the market — only 18 oz., perfectly balanced for working efficiency.

MAN SIZED — Billings Ratchet handle fits the hand of the average user. The shifter, which reverses ratchet direction, is thumb sized — no broken finger nails.

THE SOCKETS

Billings Vitalloy® Steel
Heat Treated
Hot Broached
Really Clean Sockets
Individually Inspected

THE SOCKET SETS



There's a Billings Set for every industrial use. The component parts of Billings 3/8", 1/2" and 3/4" drive sets are specifically selected to give maximum efficiency with a minimum of pieces. Attractively packaged in sturdy, metal boxes with carrying handle and snap fasteners . . . See your Billings Distributor or write for catalog.

BETTER BUY **BILLINGS**

WRENCHES & SHOP TOOLS

FROM BILLINGS INDUSTRIAL SUPPLY DISTRIBUTORS

THE BILLINGS & SPENCER COMPANY, HARTFORD 1, CONNECTICUT, U.S.A.

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STRONGER PARTS AT LOWER COST!

Presteel Stampings Eliminate Costly Machining . . . Improve Product!

The cutter bar and chain cover for this power hedge shear graphically illustrate how Presteel combines craftsmanship and expert tool design with modern methods and equipment to produce stronger metal parts at lower cost.

Identical grooves in both parts are required, to a depth 50% beyond thickness, to permit free passage of the speedy chain. Previously, these grooves were machined, but removal of the metal weakened the structure.

Presteel accurately forms and pierces these large area parts on heavy presses from .125 cold rolled annealed steel. By coining the grooves, the metal is forced back into the parts — hardening, toughening and increasing their strength. Through proper tool design, Presteel controls the flow of metal to form the sides of the grooves, sharp and square — perpendicular to the face. Machining is entirely eliminated.

Manufacturers are looking to Presteel for assistance in the design and redesign of metal stampings that will reduce production costs. Perhaps you have a problem where our metal working knowledge will save you money! Tell your story to our representative or write us direct!

Representatives in

ALEXANDRIA, VA.
BUFFALO
CANTON, OHIO
CHICAGO
DENVER
DETROIT
FORT WORTH
INDIANAPOLIS
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ALLOY STEELS AND OTHER METALS COLD FASHIONED SINCE 1883

WORCESTER PRESSED STEEL CO.

202 BARBER AVENUE
WORCESTER 6, MASS.

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HOW PROPER ROPE USAGE SAVES LABOR AND POWER

a PLYMOUTH Lifesaver

Proper use of a few simple physical laws means greater safety to workers—savings of time, labor and power. Always remember, safe loads for rope are usually higher than those for blocks. See table.

Determine Pull Needed, Safety Factor and Size of Rope

To find the pull on the fall rope required to lift a given weight, divide that weight by the number of ropes, or parts, running from the movable block. This gives you the *theoretical* pull needed. To allow for friction loss around sheaves, add 10% to the load for each sheave 3" in diameter or larger.

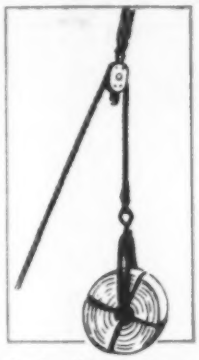
Assume 5,000 lbs. to be lifted by tackle—2 double blocks—4 sheaves, 4 parts at the movable block. The table at right shows that 10" shackle blocks are required.

4 × 10% = 40%* 5,000 lbs. + 40% of 5,000 = 7,000 lbs.

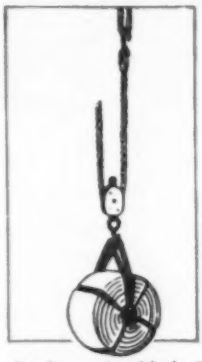
7,000 lbs. ÷ 4 (No. of parts to the moving block) = 1,750 lbs. pull needed on fall.

Assuming a safety factor of 5 to 1 is desirable—1,750 lbs. × 5 = 8,750 lbs. is the minimum rope strength required. See table on reverse side.

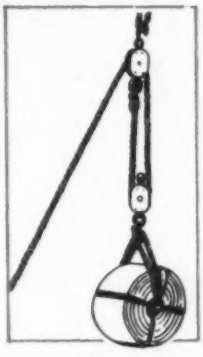
**This is the friction load to be added to the actual load.*



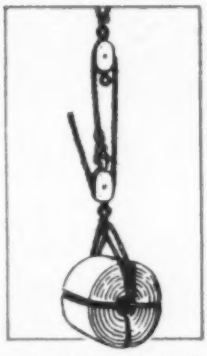
Single whip. 1 sheave. No mechanical advantage. 100 lbs. to be lifted.
1 × 10% = 10% friction loss at sheave.
100 lbs. + 10% × 100 lbs. = 110 lbs.
$\frac{110 \text{ lbs.}}{1}$ = 110 lbs. to lift the load.



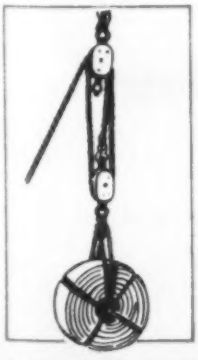
Single running block. 1 sheave. Mechanical advantage 2. 100 lbs. to be lifted.
1 × 10% = 10% friction loss at sheave.
100 lbs. + 10% × 100 lbs. = 110 lbs.
$\frac{110 \text{ lbs.}}{2}$ = 55.5 lbs. to lift the load.



Gun Tackle. 2 single blocks. 2 sheaves. Mechanical advantage 2. 100 lbs. to be lifted.
2 × 10% = 20% friction loss.
100 lbs. + 20% × 100 lbs. = 120 lbs.
$\frac{120 \text{ lbs.}}{2}$ = 60 lbs. to lift the load.



Gun Tackle. 2 single blocks. 2 sheaves—same number as Fig. III, but position of tackle reversed. Mechanical advantage 3. 100 lbs. to be lifted.
2 × 10% = 20% friction loss.
100 lbs. + 20% × 100 lbs. = 120 lbs.
$\frac{120 \text{ lbs.}}{3}$ = 40 lbs. to lift the load.



Luff or Watch Tackle. 1 single and 1 double block. 3 sheaves — 3 supporting parts. Mechanical advantage 3. 100 lbs. to be lifted.
3 × 10% = 30% friction loss.
100 lbs. + 30% × 100 lbs. = 130 lbs.
$\frac{130 \text{ lbs.}}{3}$ = 43.3 lbs. to lift the load.

Luff or Watch Tackle. Same as Fig. V, but position of tackle reversed. 3 sheaves. Mechanical advantage 4. 100 lbs. to be lifted.
3 × 10% = 30% friction loss.
100 lbs. + 30% × 100 lbs. = 130 lbs.
$\frac{130 \text{ lbs.}}{4}$ = 32.5 lbs. to lift the load.

2 double blocks — 4 sheaves. Mechanical advantage 4. 100 lbs. to be lifted.
4 × 10% = 40% friction loss.
100 lbs. + 40% × 100 lbs. = 140 lbs.
$\frac{140 \text{ lbs.}}{4}$ = 35 lbs. to lift the load.

2 double blocks, same as Fig. VII, but position of tackle reversed. 4 sheaves. Mechanical advantage 5. 100 lbs. to be lifted.
4 × 10% = 40% friction loss.
100 lbs. + 40% × 100 lbs. = 140 lbs.
$\frac{140 \text{ lbs.}}{5}$ = 28 lbs. to lift the load.

SAFE WORKING LOADS FOR COMMERCIAL BLOCKS

REGULAR MORTISE INSIDE IRON STRAPPED BLOCKS FOR MANILA ROPE

Dimensions Inches		With Loose Side Hooks			With Shackles		
Length Shell Inches	For Diameter Rope	Double and Single Pounds	Two Doubles Pounds	Two Triples Pounds	Double and Single Pounds	Two Doubles Pounds	Two Triples Pounds
3	3/8	200	300	400	400	800	1,200
4	1/2	400	550	700	800	1,400	1,800
5	5/8	500	750	1,000	1,100	1,700	2,100
6	3/4	1,000	1,500	2,000	1,600	2,400	3,000
7	7/8	1,500	2,000	2,500	2,000	3,000	3,700
8	1	1,700	2,450	3,200	2,400	3,600	4,400
10	1 1/8	2,600	3,400	4,200	4,000	5,400	6,400
12	1 1/4	3,000	3,750	4,500	5,000	8,000	10,000

HEAVY WIDE MORTISE BLOCKS FOR MANILA ROPE

6	3/4	1,500	2,000	2,500	1,600	3,000	4,000
7	1	1,700	2,450	3,200	2,000	3,800	4,800
8	1 1/8	2,200	2,900	3,600	2,400	4,700	6,700
10	1 1/4	3,000	3,750	4,500	4,000	7,000	9,000
12	1 1/2	3,600	4,800	6,000	5,000	9,000	12,000
14	1 3/4	4,400	5,700	7,000	6,500	11,000	15,000
16	2	6,000	7,500	9,000	8,000	14,000	18,000

These tables are shown through the courtesy of the Boston & Lockport Block Company and show suitable loads for one series of their standard and heavy blocks. These should be used as a guide only in ordering without assuming any responsibility, as the loads will vary between blocks in the manufacturer's line and as between blocks in other manufacturers' lines, and it should be also noted that these are suitable working loads for blocks and not for rope. Safe working loads for rope are higher than the safe working load for blocks.

ROPE SIZES and STRENGTHS

NOTE: *These specifications are for three strand rope with standard lay. To figure safe loads use at least a 5 to 1 safety factor.*

NOMINAL SIZE			NET WGT. OF 100 FEET	MINIMUM LENGTH IN ONE POUND (NET WGT.)	APPROXIMATE GROSS WGT. FULL COILS	MINIMUM BREAKING STRENGTH	
THREADS	CIRCUMFERENCE	DIAMETER				PLYMOUTH SHIP BRAND MANILA	PLYMOUTH SISAL
	Inches	Inches	Pounds	Feet	Pounds	Pounds	Pounds
6-Fine	9/16	3/16	1.47	67.9	50	450	360
6	3/4	1/4	1.96	51.0	50	600	480
9	1	5/16	2.84	35.2	50	1,000	800
12	1 1/8	3/8	4.02	24.9	50	1,350	1,080
15	1 1/4	7/16	5.15	19.4	63	1,750	1,400
18	1 3/8	15/32	6.13	16.3	75	2,250	1,800
21	1 1/2	1/2	7.35	13.6	90	2,650	2,120
	1 3/4	9/16	10.2	9.80	125	3,450	2,760
	2	5/8	13.1	7.65	160	4,400	3,520
	2 1/4	3/4	16.3	6.12	200	5,400	4,320
	2 1/2	13/16	19.1	5.23	234	6,500	5,200
	2 3/4	7/8	22.0	4.54	270	7,700	6,160
	3	1	26.5	3.78	324	9,000	7,200
	3 1/4	1 1/16	30.7	3.26	375	10,500	8,400
	3 1/2	1 1/8	35.2	2.84	432	12,000	9,600
	3 3/4	1 1/4	40.8	2.45	502	13,500	10,800
	4	1 5/16	46.9	2.13	576	15,000	12,000
	4 1/2	1 1/2	58.8	1.70	720	18,500	14,800
	5	1 5/8	73.0	1.37	893	22,500	18,000
	5 1/2	1 3/4	87.7	1.14	1,073	26,500	21,200
	6	2	105.	.949	1,290	31,000	24,800
	6 1/2	2 1/8	123.	.816	1,503	36,000	28,800
	7	2 1/4	143.	.699	1,752	41,000	32,800
	7 1/2	2 1/2	163.	.612	2,004	46,500	37,200
	8	2 5/8	187.	.534	2,290	52,000	41,600
	8 1/2	2 7/8	211.	.474	2,580	58,000	46,400
	9	3	237.	.422	2,900	64,000	51,200
	9 1/2	3 1/8	264.	.379	3,225	71,000	56,800
	10	3 1/4	292.	.342	3,590	77,000	61,600
	11	3 1/2	360.	.278	4,400	91,000	72,800
	12	4	426.	.235	5,225	105,000	84,000

Standards: Smaller sizes of ropes are usually ordered by the number of threads, the larger sizes by circumference. 6, 9, and 12-thread rope is packed in 25 and 50 lb. coils. Larger sizes are put up in full coils of 200 fathoms—in half coils of 100 fathoms. One fathom equals six feet.

FREE! **Plymouth will gladly mail you upon request additional copies of this valuable chart for every department of your plant or shop where rope is used. Foremen and workers will find it useful in protecting life and property — saving rope — cutting costs! The Plymouth booklet, "How to Put Rope to Work in Industry," contains many helpful hints which will enable you to get longer, safer, more efficient performance from your rope. Copies are available upon request.**

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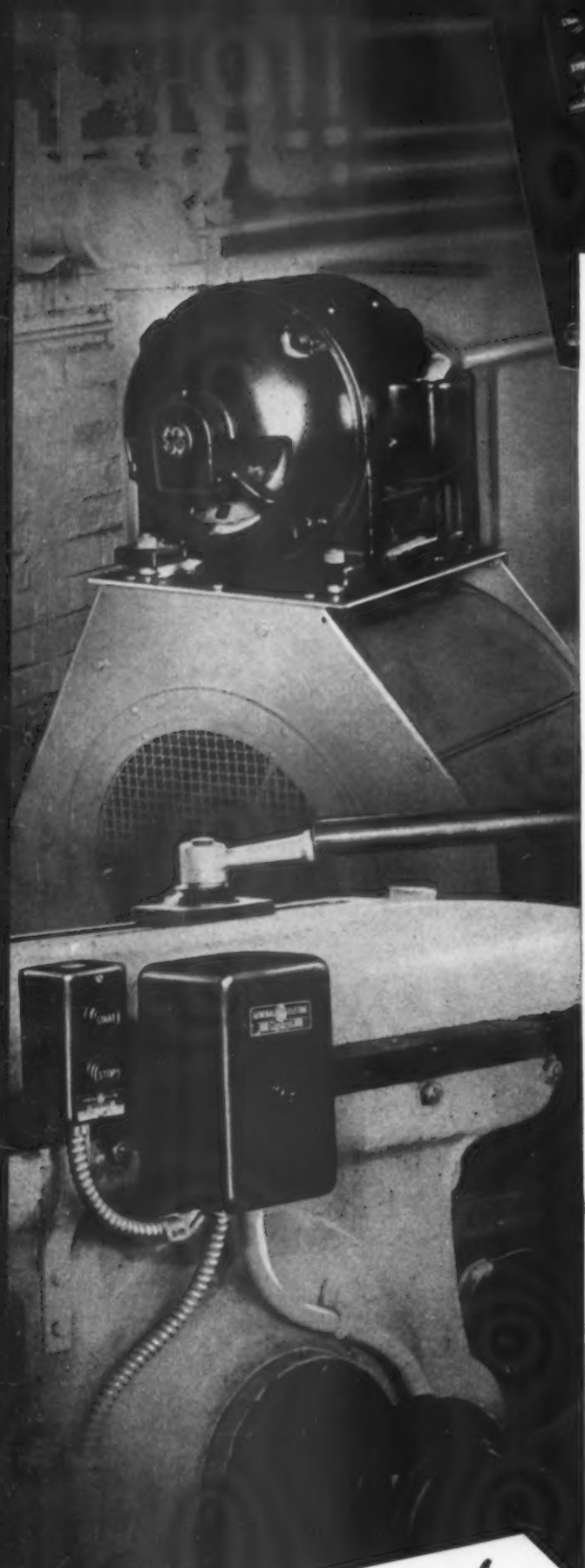

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PURCHASING

The National Magazine of Industrial Procurement

FEBRUARY, 1949

Published monthly by Peeaye, Inc.
Subsidiary of
CONOVER-MAST PUBLICATIONS, INC.
Printed at: Orange, Conn.

Editorial and Executive Offices:
205 East 42nd Street, New York 17, N. Y.

Chicago Office:
737 N. Michigan Avenue, Chicago 11, Ill.

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PURCHASING
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CONTENTS

		Pages
A New Competitor in Steel		85
Productivity and the Purchasing Agent	By S. E. Bryan	89
Why Centralize Purchasing?		90
One Steel Buyer's View of f.o.b. Mill Steel Pricing		92
PURCHASING Reports on Purchasing Opinion What Is the Fairest Policy for Taxes on Profits?		97
How Standards Are Established	By P. V. Farrell	99
Good Forms Save Money	By B. P. Hamilton	103
Inventory Standards and Control	By Joseph Albin	107
New Unsheathed Crate Design	By G. E. Henry	112
Canada's Mineral Treasure Chest	By Phil Glanzer	114
Facts on Cladding Steel	By B. Melnitsky	116
The P. A. and the Auditor	By G. W. Garton	121
Where We Stand Commodity and Business Trends		123
Nuts, Bolts, and Diplomats	By Grey Leslie	127
Purchasing Procedure at the Rotary Lift Co.	By W. E. Rier	130
The Way to Inter-American Trade	By H. H. Slawson	133
Pointers on Purchasing Power Transmission	By E. L. Cady	136
Savings through Better Packaging	By G. C. Spencer	140
New Contract Law	By Leo T. Parker	142

MONTHLY FEATURES

Ask "Purch", New Trade Literature	12
F. O. B.	64
Purchasing Previews	67
Highlights of This Issue	87
New Products—Ideas	148
Office Equipment and Supplies	245
Among the Associations	264
Personalities in the News	296
Letters to the Editor	358
Buyer's & Seller's Mart	360
Index to Advertisers	362

PURCHASING is an independent journal not the official organ of any association. It is the only publication of national scope devoted exclusively to the interests and problems of the purchasing executive in industry and government. Established 1915 as "The Purchasing Agent." Consolidated with "The Executive Purchaser."

VOLUME XXVI. NUMBER 2. Subscription rates: United States, U. S. Possessions and Canada: $4 per year, $6 for two years; elsewhere: $6 per year, $9 for two years. Single copies 50¢. Contents are indexed weekly and annually by the Engineering Index Service. Copyright 1949 by Peeaye, Inc., in the U. S. A.

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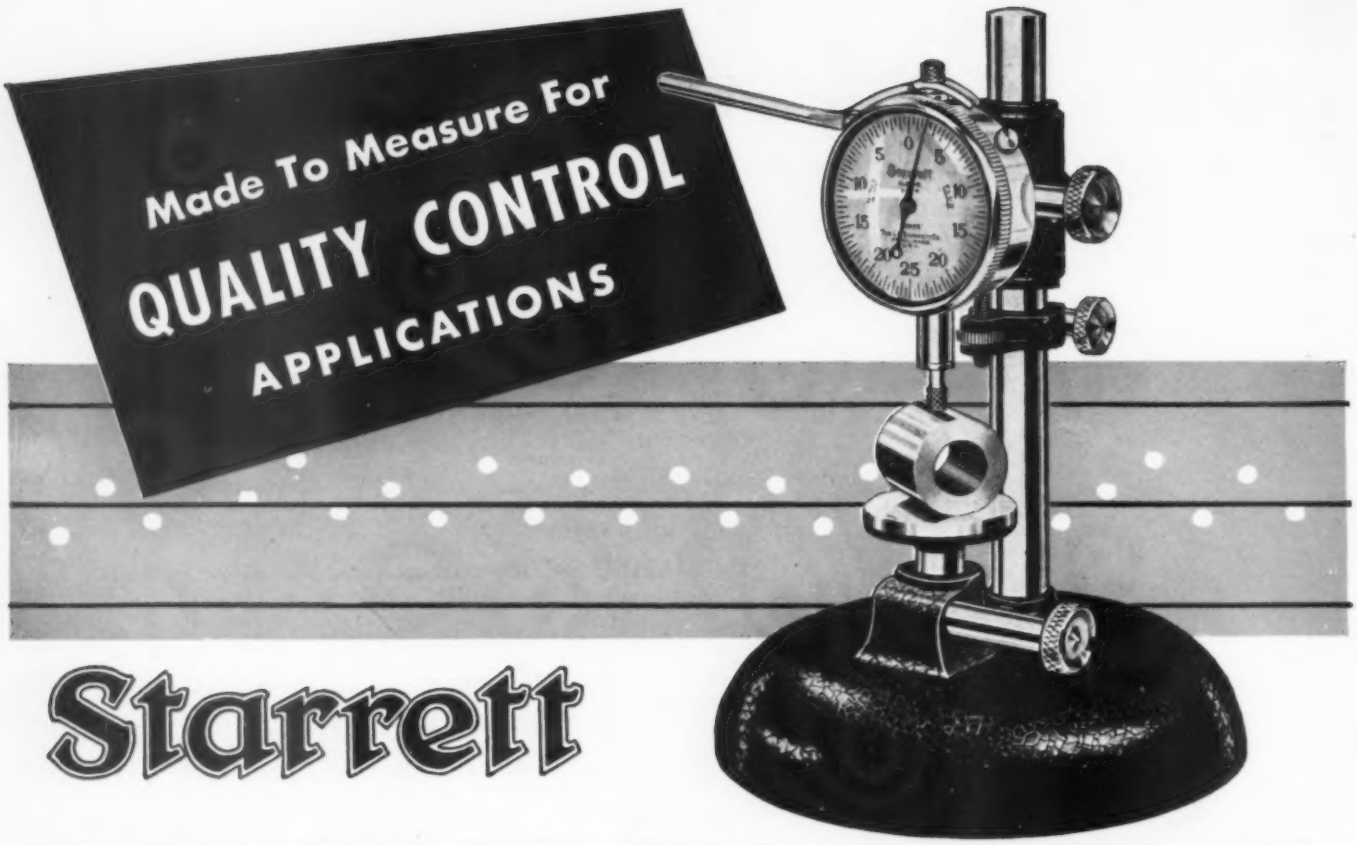

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Want Additional Product Information? See Page 19.

A New Competitor in Steel

THE President's "State of the Union" message indicates his solicitude for the plight of the poor P. A. If the steel industry doesn't expand to take care of the buyers' needs, the government will see to it that new mills are built, he says, so that there will be plenty to go around. Bring supply into balance with peak demand. The solution of our economic ills is as simple as that. Besides, it would be a good lesson for private industry.

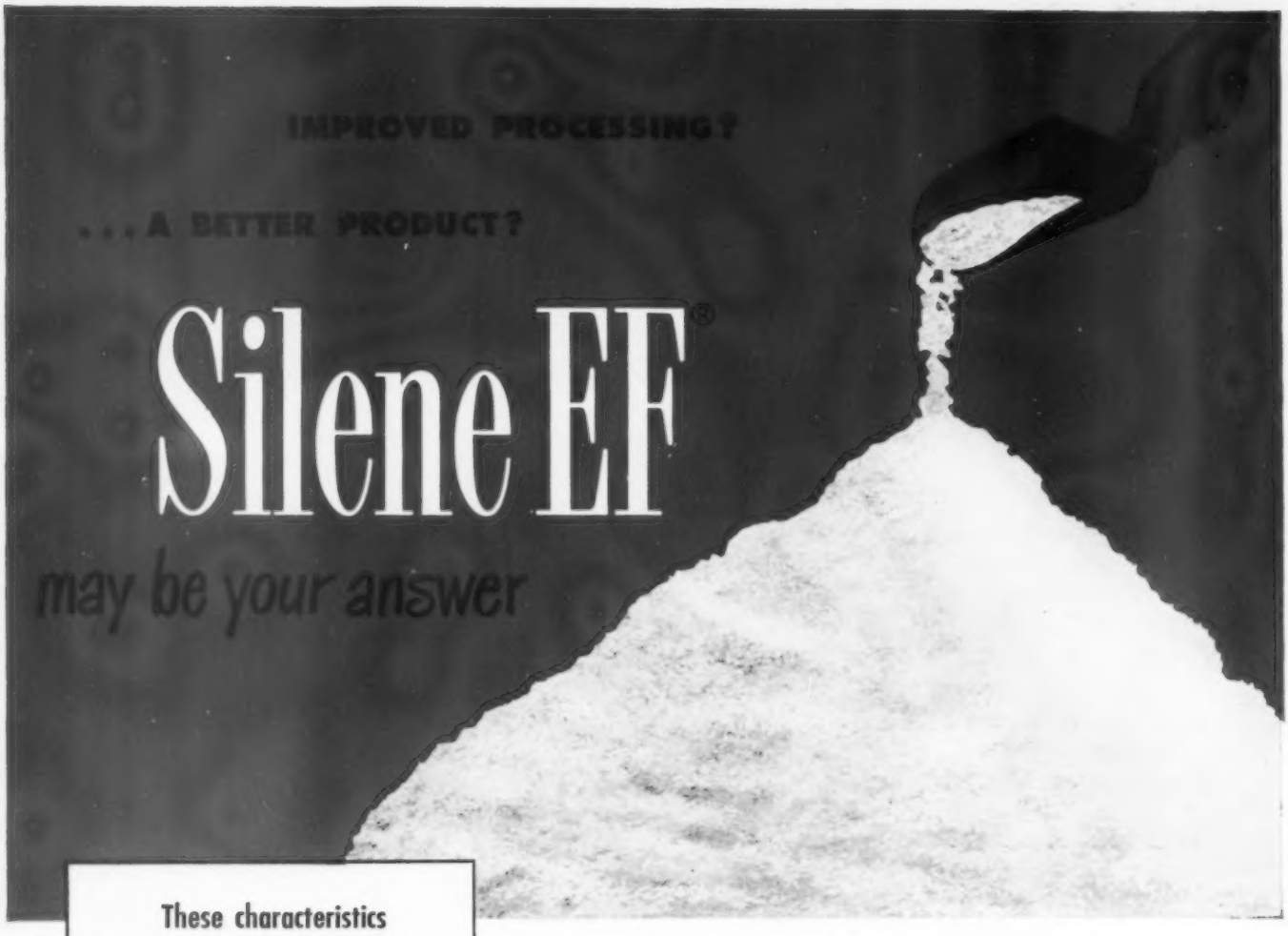
The fallacy in this proposal lies in the assumption that "plenty" and "prosperity" are synonymous terms. Our whole industrial system is built upon the fact that whenever expansion is economically justified, industry stands ready and eager to undertake the venture, with the consequence that our production facilities have been built up on a generally sound basis in respect to potential production, employment, and profitable outlets for the product. It isn't a perfect or automatic system of balance, but the American standard of living is evidence that it works pretty well.

Government competition is not fair competition. Neither Mr. Truman nor the government itself has any conspicuous record of business success. Government steel would be high cost steel. Government accounting methods, with cavalier disregard for investment and costs, and immunity from taxes and the necessity for operating at a profit, might gloss over this detail. Overexpansion is a serious problem, particularly in an industry where so much depends on maintaining a high operating rate. And if government became a major employer in any basic industry, the effect on wage rates and productivity is very disturbing to contemplate.

It is not a function of government to engage in business. It is warranted only in a national emergency, such as war production, when the magnitude of sudden need and the temporary nature of that need puts the necessary plant expansion beyond the resources of private enterprise and the need transcends economic considerations. We have been writing off that experience in DPC sales as a part of the war cost, but there are few complaints on that score. A government excursion into peacetime steel production, however, is an entirely different matter. There is a temptation to regard all basic industries as "utilities" in the public interest, but such a policy moves dangerously in the direction of nationalization of industry, which would destroy the very foundation of our national economic life.

Stuart F. Heinritz

This Month's Cover Photo. E. L. ("Lee") Clayton, Director of Purchases, The Philip Carey Manufacturing Co., Cincinnati, Ohio, is Vice President of the National Association of Purchasing Agents for District No. 6, which includes the Akron, Canton, Cincinnati, Cleveland, Columbus, Dayton, Erie, Northwestern Pennsylvania, Pittsburgh, Springfield, Toledo, Tri-State, and Valley Associations, with a total membership of some 1,800 purchasing men. Mr. Clayton is a past president and national director of the Cincinnati Association. He served as program chairman for the Sixth District Conference at Cleveland in 1947, and presided at the 1948 District Conference in Cincinnati last September.



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Want Additional Product Information? See Page 19.

HIGHLIGHTS

A brief summary of outstanding features of timely interest and importance in this issue, to conserve the time of busy readers

Many dire predictions have been voiced on the probable effects of **f.o.b. Mill Pricing** of steel and the hardships that will be visited upon the buyer. On page 92, a purchasing agent who is directly concerned with this problem analyzes the situation and concludes that most of the fears are groundless. The new pricing policy, he contends, should not curtail the present availability of steel to any buyer, though its cost will be raised in most cases. He anticipates an eventual realignment of customers and sources on the new cost basis, with some difficulties in the transition period, but looks for increasing competition as producers in the more highly concentrated producing districts seek to extend their market areas. Read this thoughtful and timely discussion of a vital topic.

Are you one of those who take **Standards** for granted? Then turn to page 99 and learn of the thorough study, broad organization, and comprehensive procedure behind every officially recognized standard in industry. The recent selection of a prominent purchasing man to head the American Standards Association stresses the fact that the buyer's interest is a basic factor in establishing sound and acceptable standards.

Is **Centralized Purchasing** practicable and advantageous for the smaller company and in non-manufacturing types of organizations? The answer is "Yes", and the reasons for that answer are summarized on page 90.

Almost every purchasing agent buys **Power Transmission** in some form or another. It is a subject with many ramifications, not only because of the variety of units in the transmission sequence and their technical nature, but because shop operating practices have a large influence in determining the qualities and characteristics to be sought for satisfactory performance. The article on page 136 provides some helpful pointers.

The federal budget and tax program for the coming year contemplates a substantial upward revision of corporation taxes. This month's survey of purchasing opinion seeks an economically sound and equitable relationship between business **Profits and Taxes.** Compare your views with those summarized on page 97.

The third and concluding article in a series covering purchasing and inventory methods of American Airlines deals with **Inventory Standards and Control.** Turn to page 107 to see how this purchasing organization sets control points and quantities to provide for adequate stocks at minimum investment to service and maintain a nation-wide operation.

Clad Steel, a composite material with a true surface of alloy integrally bonded to the relatively inexpensive base metal, has found many useful and economical product applications. The process is illustrated and described on page 116, with a listing of typical uses in various industrial fields.

The ceremonies attending the recent signing of accord on **Screw Thread Standards** by official representatives of Great Britain, Canada, and the United States had all the flavor of an international diplomatic treaty. And with good reason, for unification, resulting in uniformity of engineering practice and interchangeability of machine and product parts, opens the way for broader trade opportunities, mutual service in peacetime, and strength for mutual defense. Turn to page 127.

Better Packaging can save money, material, time, space, transportation cost, breakage and loss in transit. One company's experience in packing a difficult product is reported on page 140, and a radically new development in crate design is described and illustrated for your information on page 112. One or both of these methods may save money for your company too.

There are also important savings to be made in proper **Form Design** and purchasing. The basic principles are outlined by B. P. Hamilton on page 103. For a system of practical forms to cover purchasing department procedure, the series illustrated on page 130 offers you some good ideas tested in actual use.

Leo T. Parker's article on **New Contract Law,** appearing on page 142, cites recent higher court decisions that illustrate the modern legal interpretation of business agreements and explains the liabilities of buyers and sellers under the contract terms.

Are you making full use of these monthly departmental features compiled especially to keep you informed on recent industrial developments? A selected list of new **Trade Bulletins and Catalogs** that are yours for the asking (page 12) and the illustrated summary of **New Products and Ideas** (page 148) will help you keep abreast of industrial progress. The **Forms Forum** (page 245) shows successful procedures from other purchasing offices.

STEEL ALLOCATIONS

and

What We Are Doing About Them

As you know, the Steel Products Advisory Committee recently agreed to a six month extension of voluntary allocations of steel for most industries already included in the allocation program—and the President has now asked for authority to establish priorities and allocations for key materials in short supply. On the face of it, this action and stepping up of steel requirements for defense and the Marshall Plan point toward a continuation of peak demand for steel.

But remember that steel distributors in general and Ryerson in particular will always be in there battling to make available to you the largest possible tonnage. Last year Ryerson was able to serve over 50,000 manufacturers, builders, and utilities. This year we expect to serve many thousands more.

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Productivity and the Purchasing Agent

Modern economists are discarding the theory that purchasing is a non-productive function.

Utility depends on time, place, and ownership as well as on form of material.

The evolution of economic thinking is reflected in current management practice.

● ***By Stanley E. Bryan***
Instructor in Purchasing
School of Business, Indiana University

THE venerable Adam Smith, whose bones are respected by most economists, would have turned a jaundiced eye on the idea that the purchasing agent is productive. Partly due to such traditional views of Smith and the older economists the technical functions in many organizations are still classified for purposes of accounting as "indirect" or "non-productive." Though realistic thinkers know that the purchasing agent and other personnel aiding in supply activities are performing productive functions, it is interesting to trace the evolution of some of the economic ideas concerning productivity as they relate to purchasing.

The Physiocrats of France, so named because they sought to apply natural laws to economics, and who might be considered as having founded the first system of political economy, would have classified purchasing as a sterile and non-productive occupation. Francois Quesnay (*Economic Table*, 1758), physician to Madam de Pompadour and King Louis XV, one of the leading physiocrats, declared that only agricultural occupations were productive because they alone produced a surplus.

Smith (*Wealth of Nations*, 1776), whose ideas on private enterprise, profit, free trade, and division of labor started the Classical School of economics, expanded the definition of productivity to include any activity which resulted in a tangible vendable product. This definition of productivity excluded services such as those rendered by doctors, lawyers, kings, and purchasing agents. Later members of the Classical School moved away from Smith's position and included these immaterial services in their definition of production. They went farther and stated that the economist had no business to pass judgment on the usefulness of products or services as long as people desired them.

The Classical concept of productivity, with no ethical concept, aroused the ire of Romanticists such as John Ruskin and Institutionalists such as Thorstein Veblen. Ruskin coined the word *ilth* as the opposite to *wealth*. It was to apply to products and services which did not meet social approval. Presumably, a purchasing agent who transgressed the purchasing profession's code of ethics would be producing *ilth*.

Thorstein Veblen (*The Engineers and the Price System*, 1921), who utilized his keen wit and critical phrasing to attack the propositions of the Classical School, had no illusions as to the productivity of such technical functions as purchasing. Indeed he spent considerable effort pointing out that businessmen, with the "inordinate productivity" of machines and allied technical services, were afraid to give the technicians their head because the markets might be swamped with goods; so businessmen practiced "conscientious withdrawal of efficiency" to keep industrial efficiency "sub-normal"—in fact they practiced "capitalistic sabotage" in order to make greater profits.

Some of the "inordinate productivity" which Veblen emphasized can be traced in part to the impact of the ideas of Frederick Taylor upon productivity. Taylor (*Scientific Management*, 1911), an operating engineer, took Adam Smith's principle of division of labor and expanded it by separating the planning function from the performance function. Smith had applied his principle only on the performance level. Taylor, expanding it to the planning level, advocated the hearty cooperation of technical management in such matters as having the right materials at the right place at the right time. Planning could aid by adding economy and effectiveness to performance. Scientific procurement, supply, and other "planning" functions would facilitate greater productivity and would result in greater prosperity for the workers, the employers, and for the public.

In the matter of procurement there is a striking parallel between the modern production man, who sees his productivity diminished by lack of proper materials, and the officers of the children of Israel who pleaded, "There is no straw given unto thy servants, and they say to us, make brick." (*Exodus* 5:16). Today, on the Berlin Airlift, C-54's thudding into Tempelhof at regular intervals accentuate the technical problem of supply with its general need for rhythm and continuity—factors long recognized in the productive effectiveness of manufacturing. For some time past the complete rhythm and continuity of supplies, so necessary for effective production, has been endangered by war dislocations and scarcities to the extent that production depends largely upon the success of procurement practices. This condition continues into the present and in this day of "finders", "materializers", and even "miracle men" there are organizations which, by using top executives in procurement activities, have "expedited" their way from losses to profits. (*Fortune*, 36:6: 94).

This situation is apt to continue into the future. Every item that is fabricated seems to take more material per item and to compete with other items for the necessary material. There is the added factor, now recognized officially by national stock-piling and by warnings such as that of Secretary of Defense

(*Please turn to page* 346)

Why Centralize Purchasing?

An inquiry and a reply outlining the purpose and advantages of central purchasing.

Purchasing is a specialized function, calling for specialized responsibility.

The principles of central purchasing can be applied in any size organization.

THE INQUIRY

To the Editor:

I would appreciate your sending me some information regarding the establishment of a central purchasing system in a medium sized association such as ours. The majority of our purchases are of paper, inks, etc., that are used in publishing our magazines, and a reasonably large amount of office furniture, building maintenance supplies, etc.

We have approximately 25 different departments and 800 employees. Most of the purchasing is now done by the department heads, and we have had some discussion as to whether or not a central system would be more efficient and economical.

THE experience of more than twelve thousand enterprises in all sorts of operations where materials and supplies are used and must be purchased—in manufacturing and service industries, public utilities, banks, insurance companies, governmental units, schools and institutions—provides convincing evidence that centralized purchasing is not only practicable, but offers substantial advantages and economies. Whether a full-time purchasing department is warranted depends on the volume and variety of purchase requirements, but the principle of functional specialization and centralized responsibility for purchases is applicable in any case.

From the administrative standpoint, the first advantage is that there is a single and definite responsibility for the act of procurement and accountability for materials, which otherwise are easily lost sight of in operating expense accounts, or relegated to secondary importance in relation to the department head's primary responsibility for his departmental function.

Along with this, a definite control is provided for authorization of purchase expenditures, allocated to specific projects or uses as a part of the general cost system. Too often, purchase expenses are incurred that serve only to cover up or compensate for deficiencies and errors in operating practice.

Other controls are also established. Standardization becomes possible with respect to supplies used in common by two or more departments, with the result that fewer varieties can be bought in larger and more economical quantities, and duplication and waste are avoided. An immediate corollary to this is that smaller aggregate stocks are required to be kept on hand, and these smaller stocks—representing a smaller investment in supplies—will serve the organization more adequately. Current requirements of the several departments can be met from the common supply. With ordinarily competent determination of minimum stock quantities, there is little likelihood that needed items for several departments should run out concurrently, or indeed run out at all. Further, by such coordination, it frequently happens that a requirement can be satisfied by assignment or transfer of supplies or equipment rather than by making an additional and unnecessary purchase.

A central purchasing system provides records of usage and costs and sources that are invaluable in applying past experience to current needs and in projecting future requirements. It becomes unnecessary to start all over again from the beginning with each new project, and to repeat the elementary stages of purchasing studies and decisions, or to guess at probable usage with the equally dangerous possibilities of underbuying or overbuying.

Likewise, by having a central record of all purchases, any particular advantages enjoyed by one department in its purchases can be shared by all departments, to the advantage and benefit of the organization as a whole. This is not likely to be the case where purchasing for the several departments is done by the respective department heads as individuals, and no one knows what the others are doing. Instances can even be cited where, under the system of scattered purchasing authority, such advantages are regarded as a part of interdepartmental competition and the advantage is denied to other departments.

With central purchasing, it almost inevitably follows that a better job of buying will be done. Department heads may challenge this statement in the light of their own intimate knowledge of their requirements. It is nevertheless the fact, and this can be asserted without the slightest derogation of the department head's knowledge or ability. To know a product is one thing, and

to know how to buy it is quite another. Specific, undivided attention to the purchasing function, as contrasted with purchasing as an incidental duty to other responsibilities, means that buying decisions will be made on a scientific and objective basis, with a full exploration of supply possibilities, market factors, and cost differentials, rather than relying on personal judgment, expedience, convenience, or limited experience with a single satisfactory product, frequently without the complete knowledge of what may be available and without the interest or the time to acquire that knowledge.

Over-All Cost Counts

To the department head, the actual purchase may honestly appear to be a relatively unimportant detail in comparison to his major responsibility, especially if he is using a product that is satisfactory from the operating standpoint. Yet in the individual instance—and even more in the aggregate of all company requirements—the purchase expenditure is important enough to warrant thorough consideration on its own account. A truly satisfactory purchase must be satisfactory from the economic as well as the operating standpoint. Most department heads are cost-conscious so far as their particular operation is concerned, but in the interest of operating efficiency it often happens that purchase dollars are tossed out of the window, with nobody the wiser. It is the over-all cost that matters, and purchase costs usually represent a large part of that final cost—not infrequently, in manufacturing industry, the dominant part. The irony of the situation lies in the fact that ordinarily competent purchasing can quickly detect and correct such wastes to the complete satisfaction of the department head.

This more complete and more proficient procurement service extends also to other phases, such as following-up orders, identifying deliveries and putting materials promptly to use, systematically checking vendors' invoices and passing them for payment within the discount period, and handling any adjustments which may be necessary with vendors.

It is also true that experience in purchasing develops special skills and results in better performance, just as is the case in any other activity. The application of these skills in developing sources of supply, negotiating contracts, scheduling purchases, and the like, serves to benefit the using department and the organization as whole, in respect to reliability of supply maintenance of quality, and reduction of costs.

Some of the means by which these benefits are achieved have already been suggested. Among the more obvious ones that should be mentioned in this connection are:

1. Review of specifications to bring them in line with commercial standards of quality and packaging.
2. Combination of requirements to permit purchasing in economical quantities.
3. Anticipation of requirements so that purchasing may be programmed in terms of the right quantity and the right time to buy.
4. Elimination of rush orders, so far as possible.
5. Elimination of excessively small orders, expensive both to the buyer and the seller.
6. Handling miscellaneous small purchases in such a way as to take them out of the expensive retail classification.
7. Selection of the most advantageous supply sources, rather than merely the most convenient ones.
8. Development of alternative supply sources on all major items, to insure continuity of supply and to encourage competition.

15% Saving in Purchase Costs

It should be noted that these methods of purchasing are inherent in centralized buying practice itself. They do not contemplate any change in the items purchased, and they are not dependent on the individual proficiency of the buyer in negotiation. It is reliably estimated, with considerable evidence to support the claim, that such methods in themselves will result in a saving of 15% or more in purchase costs as compared with scattered purchasing authority and action. The cost savings attributable to buying proficiency and the more extended analysis of requirements from the purchasing angle go on from there.

The advantages or savings aside from actual cost of materials and supplies, while more difficult to measure, may easily represent an even greater amount. For example, there is the saving of time for department heads by relieving them of the necessity of interviewing salesmen, seeking market sources, negotiating purchases, and the clerical detail of issuing orders or seeing that they are issued. This is an important consideration, one that is basic in the whole principle of functional division and assignment of responsibility. By eliminating these interruptions and extraneous details, the department head is enabled to give undivided attention to his primary responsibilities of administration and supervision, so that not only purchasing performance but also operating performance in all departments should be improved.

It should be emphasized that the centralization of purchasing authority does not deprive the department head of any proper prerogative in respect to approval of the quality of materials with which he is to work. It does, however, definitely assign to the purchasing department the prerogative of selecting the source from which these materials are to be procured. In our competitive business economy, the great majority of materials and products are available from more than one source when the quality requirement is objectively defined, and this fact is one of the fundamental considerations in good purchasing. Also, the purchasing department has the prerogative of determining—within the limitations of actual delivery requirements to meet operating schedules, and subject to executive authorization for forward commitments—how much of an item is to be purchased, and at what time. It is not within the function of purchasing to tell any other department what it needs; furthermore, the purchasing officer doesn't buy for the sake of buying, but to satisfy a particular requirement, present or foreseen. It is his responsibility to find the material or product that will most satisfactorily and economically satisfy the need, and to have it on hand when needed. In this sense, central purchasing is a service to operating departments. It is common experience that when this service has an opportunity to prove itself, it is welcomed.

Other Advantages

There is a further advantage in central purchasing, in that it insures a consistent policy in respect to dealings with vendor companies and their representatives, and provides an opportunity for the development of good will and good business relationships in these outside contacts, greatly to be desired.

The system itself need not be a complicated one. For the small business organization it can be very simple. The actual procedure in a buying department requires three basic forms:

1. A requisition to appraise the purchasing officer of the require-

(*Please turn to page* 354)

One Steel Buyer's View of f.o.b.

Competitive marketing will affect costs but not the availability of steel.

Steel sales and purchasing policies must deal in long-term relationships.

Present tax laws must be altered to make f.o.b. pricing economically sound.

The author of this article is the Purchasing Agent of a large steel consuming plant, whose name is withheld at his request. He presents this analysis as a personal opinion, from the buyer's viewpoint. His discussion of the basing point vs. f.o.b. mill pricing controversy is objective but not theoretical, for he is faced with the same problems as other buyers in respect to his steel requirements. His plant happens to be located within the natural market area of one of the larger steel producing centers. Buyers at a greater distance from the mills may not agree with his contention that the new pricing system will not affect the availability of steel for their needs. Some of them have told us that it has already done so.—Ed.

A NUMBER of people in the steel industry and a number of consumers of steel have made very gloomy predictions regarding the effect of the change from basing point to f.o.b. pricing. This has included forecasts of ghost towns, upheavals in competitive position between consumers of steel, and sharp concentration of industry around steel producing centers.

An objective analysis does indicate that the change in method of pricing will produce changes in our method of doing business, but a logical approach also indicates that results may be quite different from those so widely advertised in the public press, and probably considerably less serious than anticipated.

Distance from a steel producing center *per se* should have no effect on the availability of steel, if a steel consumer purchases from the nearest steel producer. No new advantages are created for a man who is close to a steel producing center. In any case difficulties of plant construction, labor and housing certainly prevent any large migration of industry during a steel shortage. When the time comes that these factors are not controlling, it is very unlikely that there will be any reason for relocation of a steel consumer nearer to a mill.

When Supplies Are Scarce

The logical way to examine the problem is to discuss it under two entirely different conditions of the basic economy. It is one problem when steel is in very short supply, and it is a different problem entirely when steel is in adequate supply. The only connection between the two is the action which may be motivated by anticipation of a future change in conditions.

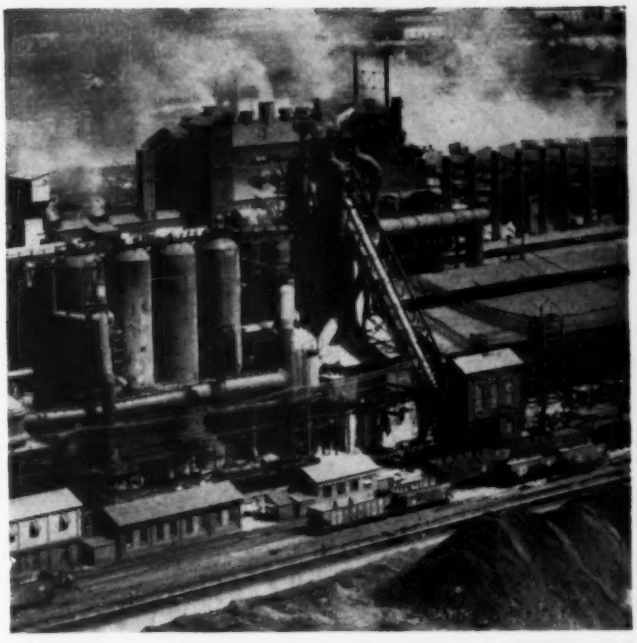
During a period of steel shortage, a change from basing point pricing to f.o.b. pricing means a net increase in realized price to the steel producer. Under basing point pricing, most steel mills found it worthwhile to ship out of their normal trade area and absorb the necessary freight to make this possible. There are some indications that mills in certain areas have felt that $1 to $1.50 a ton average is a normal marketing cost for being able to ship outside of their normal marketing area. Since the change to f.o.b. pricing wipes out freight absorption, to this extent the change is a price increase.

During a period of continued short supply, f.o.b. pricing removes any incentive whatever for a steel producer to favor one customer over another because of distance or because of freight rates. Please note that we carefully exclude any incentive that they may have to anticipate conditions in a different type of market. In such a shortage market the buyer is usually willing to pay any freight necessary to get an adequate supply of steel. Therefore, neither the buyer nor seller is particularly concerned about the freight problem, and it is safe to say that shifts by steel producers in their customer list will be entirely for the purpose of hedging against conditions to be expected when competition for tonnage is the controlling factor in the distribution of steel. We will show later that the mill has little to gain by such a move. Before f.o.b., the mill had a strong unweighted profit motive.

Natural Market Areas

Suppose we leave for later examination the interim period and examine the conditions which must exist under f.o.b. pricing when steel is in more than adequate supply. Under f.o.b. pricing, just as under basing point pricing, each mill has a natural market area. This area is that portion of the market in which the freight is less from their mill to the consumer than it is from any other mill to the consumer. Unfortunately, the potential consumption in a mill's natural market area is usually quite at variance with the mill's production capacity. For some mills in areas where production capacity is concentrated, the natural market area is completely incapable of ab-

Mill Pricing



Steel production is highly concentrated. Will f.o.b. mill pricing lead to a similar concentration of the industries that depend on steel as their raw material?

Trainload of ingots. Who will get the steel?

sorbing the production. This is particularly true of areas such as Pittsburgh and Youngstown. On the other hand, in areas such as Detroit, consumption will usually be far greater than the local mill's capacity. Under the basing point system, this was taken care of by the mill in the excess production area absorbing the freight necessary to compete in the shortage area. Under the f.o.b. pricing system, there will be no way of absorbing the freight, and the only method of competing will be by changing the base price itself.

Changing of the base price at one producing point or a change in the price differential between two producing centers will in effect move the dividing line between two market areas. For example, if the base price of steel in Youngstown is made less than the base price of steel in Cleveland, the boundary of the marketing area of the Youngstown district will be moved from its present position to a point closer to Cleveland. If the base price of steel in Youngstown is made lower than the base price in Cleveland by an amount equal to the freight from Youngstown to Cleveland, then the natural marketing area of the Youngstown district will include not only the Youngstown district but all of the Cleveland district. As a matter of fact, it will not only move the boundary line of the Youngstown marketing area into Cleveland but a differential of this size will also eliminate Cleveland competition in large areas beyond Cleveland because of the fact that freight rates are not in proportion to distance but tend to become less per mile as the distance increases.

Therefore, under a condition of adequate supply, each mill will be compelled to adjust up or down their base price sufficiently to make its marketing area coincide in its consumption potential with its proportionate share of production capacity. For example, Pittsburgh will have a lower price than Youngstown. This will not be in excess of about $3.50 a ton. Otherwise, Pittsburgh would completely engulf Youngstown's natural market area. Youngstown will have a lower base price than Cleveland. This also will be less than $3.50 a ton. Both Youngstown and Pittsburgh have a larger production capacity (approximately 40% of the total) than the potential consumption of their natural marketing areas (approximately 20% of the total). The Chicago area is probably almost in the balance. Therefore, its base price can be practically the same as Cleveland, perhaps slightly more. However, the Detroit area has a far greater market potential than its proportionate mill capacity. Therefore, Detroit can get a premium over both Cleveland and Chicago.

This will inevitably mean that if f.o.b. pricing continues to exist, we will have a different base price for each steel commodity at each steel producing center. This fact is fairly generally agreed upon, and it is upon the consequences of this fact that so much disagreement exists.

Fundamentally an f.o.b. price pattern is sound because it will tend to encourage the location of both steel producing centers and the location of steel users where the total net cost of production is least. This was not true under the basing point system. Furthermore, the basing point system produced many wasteful and costly practices. There were large tonnages of steel produced in Chicago which moved into the Pittsburgh district and en route passed large tonnages of the same item produced in the Pittsburgh district moving into the Chicago area. No one wants to defend such economic waste.

From the point of view of the location of the steel mill, the incentive will be to locate a mill in the place in which the combined total of raw material costs, raw material freight, and finished steel freight costs to the final users make the smallest net sum. This also was not true under the basing point system, because under the basing point sys-

TABLE I

THEORETICAL SALES ANALYSIS FOR AN ISOLATED STEEL MILL

Difference in Freight to Customer's Plant from Chicago vs. Milwaukee	Tonnage Sold (% of Capacity)			Total Tonnage Consumed of Products Mfd. by Milwaukee Mill (% of Capacity)		
	Tons	%	Cumulative	Tons	%	Cumulative
+$3.00 or more	xxx	20%	20%	xxx	30%	30%
2.50 — 3.00	xxx	25%	45%	xxx	30%	60%
2.00 — 2.50	xxx	15%	60%	xxx	20%	80%
1.50 — 2.00	xxx	10%	70%	xxx	15%	95%
1.00 — 1.50	xxx	5%	75%	xxx	20%	115%
.50 — 1.00	xxx	5%	80%	xxx	25%	140%
.00 — .50	xxx	5%	85%	xxx	20%	160%
— .50 — .00	xxx	5%	90%	xxx	20%	180%
— 1.00 — .50	xxx	5%	95%	xxx	40%	220%
— 1.50 — 1.00	xxx	3%	98%	xxx	40%	260%
— 2.00 — 1.50	xxx	1%	99%			
— more than 2.00	xxx	1%	100%			

tem it was possible to make customers close to the mill pay the freight to customers at distant points. Certainly the new pricing system may produce sharp changes in the relative profit making ability of one steel company vs. another. For example, if steel can actually be made at the mill as cheap in Detroit as it can be made at Pittsburgh, then Detroit mills will be more profitable. But if that is so, then there is no economic justification for expansion of steel facilities in Pittsburgh instead of in Detroit. However, if the net total cost of laying steel down in a consumer's plant in Detroit is less when that steel is manufactured in Pittsburgh than when it is manufactured in Detroit, a change to f.o.b. pricing will in no way change the desirability of producing the steel in Pittsburgh.

If we assume that an f.o.b. market pattern has been created and exists, there is no new justification for any relocation of plants just to move close to a steel producing center. A steel user in Denver will still be under the same freight disadvantage he has always been under when compared with a manufacturer in Chicago. There is no *new* incentive for him to move to Chicago. On the other hand, a large steel consumer in Chicago will be penalized with respect to a steel consumer in Pittsburgh even though both of them are next door to a mill. But, after all, there is no reason why the man in Pittsburgh should have been penalized in the past in order to subsidize the man in Chicago. Under a free enterprise profit and loss system, profits should go, all things being equal, to the person who has the lowest true cost.

Making the Transition

So far, we have only examined the situation under two stable conditions. We have assumed either a stable steel shortage or a stable condition of plentiful steel supply. The action during a transition can be quite different from anything we have discussed so far.

It is quite reasonable to suppose that there will be little price stability when steel first becomes plentiful. No two steel companies are likely to agree as to what constitutes their share of the total steel production. Any difference of opinion will be reflected in a difference of opinion as to the size of the price differential which should exist between the two mills. Under the basing point system, the base price was a very definite clean-cut reference line or bench mark. Any company which attempted to enter into price competition proclaimed that fact to the world the minute that it deviated from the established base price. Under the f.o.b. pricing system, base price at different steel producing centers must be different; how much it should be different is another problem.

If the transition takes place during a period of steel scarcity, there is no possibility of a steel consumer directly influencing shifts in market pattern because he is forced to take the steel he is offered rather than choosing between sources. The steel producer calls the turn. But during a period of scarcity the steel producer has no interest in the location of his customer except as that location may affect his future ability to compete in a buyer's market. As long as the steel scarcity continues, the marketing policies of the steel companies will be controlled almost entirely by the action they anticipate from their customers during a future period of plentiful steel supply and by the action they think their competitors will take in the meantime.

The buyer's preference for lowest possible cost will certainly mean that many steel users will find it desirable to change sources when they can. Conversely, many mills are now supplying customers who are definitely temporary for the same reason. Can the steel producer gain anything by making a change now which he obviously is going to be forced to make some day? The advantage of making it now is questionable.

A Hypothetical Case

It is probably in order to first examine the marketing situation of an isolated steel producer. The analysis that we make for an isolated mill will be valid for a more complex situation such as we have in Pittsburgh, Cleveland, and Chicago, where several mills are located quite close to each other. The problem may appear most complex but exactly the same principles will apply. For example, a hypothetical steel producer in Milwaukee would have no competition closer than Chicago. During a period of plentiful steel supply in this hypothetical producer's base price would be controlled by the base price in Chicago. The maximum difference between the Milwaukee price and the Chicago price is plus or minus the freight rate from Chicago to Milwaukee. If the price in Milwaukee is higher than the Chicago price by an amount equal to the freight rate, then the Milwaukee market area is reduced to zero. The reverse of this situation exists when the Milwaukee price is lower than the Chicago price by the full amount of the freight. Incidentally, for simplicity; we disregard water transportation.

The determination of the price differential between Milwaukee and Chicago will be a simple process, although it may appear to be a complicated and painful experience for both buyer and seller.

As long as a severe steel shortage exists, the Milwaukee mill's ability to sell its production will be unaffected by the location of its customers. As the demand eases, certain customers will find that they can buy either in Chicago or in Milwaukee. They will probably choose the source which can deliver steel at their door for the lowest total cost. For any given difference in base price between Chicago and Milwaukee these customers can definitely be identified by taking the difference in freight from the two mills and comparing with the difference in base price.

The Milwaukee mill could analyze its sales as shown in the table herewith. In this theoretical example, 85% of the mill's sales are in its natural market area. If steel were in plentiful supply, and if the mill sold at equivalent base prices with those prevailing in the Chicago producing area, it would stand to lose 15% of its market.

Suppose a market survey of potential customers' total consumption of the products made at this mill showed the pattern indicated in the right hand column. The Milwaukee base price could be $1.50 more than the Chicago base and still the mill could compete on price within an area large enough to move its entire output.

This type of market survey is based upon a definite level of business activity. However, the validity of the survey isn't affected by the level of business activity. If steel is generally in short supply, then actual consumption is the truest criterion even though all customers might be getting less than they could use.

Operating Levels

With less than full capacity operation, each mill would prefer to operate at above the industry average. The chance of doing this is very remote for any extended period, unless there is a major business depression. It is fair to assume that the customers requirements of each mill are in general proportion to the general level of business activity. This being so, any mill which is able to operate at more than the average for the steel industry on a similar product will inevitably have less reserve capacity to care for future peak requirements. If customers are dropped, it may be difficult to re-establish relations. If customers are rationed, many who can afford it will establish permanent supplemental sources since the rest of the steel industry otherwise will not be at capacity.

As a practical matter, it is questionable if any mill will be permitted by competition to operate at much more than the industry average for the specific product. Price competition will be far more prevalent than it has been under the basing point system.

If the preceding analysis is accurate, then there is little reason for a steel producer to attempt to anticipate possible shifts in customers.

The need for tonnage to spread fixed costs is generally understood as a basic fact of life in the steel industry. An interesting by-product of these relationships is apt to be a great increase in secrecy regarding operating levels under normal conditions. Information about operating levels under basing point pricing was useful but not strategic information. Under f.o.b. pricing, a known difference in operating rate is an invitation to price competition and a potent factor in a buyer's choice of supply. The problems of the steel company's sales manager, who tries to get more than an average share of the market, will be complex indeed. So will the problems of his customers. Many will forego the temptation to go after the extra tonnage and take instead a higher average price on a smaller market.

Disregarding ethics, what will an isolated mill be able to do to get more than its share of the market? Some customers he can depend upon. The customers close to the mill will frequently be economically unable to deal with any other source. It would be particularly difficult for such users in periods approaching tight supply since distant mills would consider any sales to such a customer as abnormal, unnatural and temporary.

So to a great degree the customers close to an isolated mill are at the mercy of that mill's sales policy. An entirely different situation exists along the boundaries of a mill's market area. As this boundary is approached, the cost differential between mills decreases. By concentrating on these it may be possible for an isolated mill to take in more than its proportionate market, but only if competition sees fit not to prevent it and if the mill is willing to penalize the major portion of their customers to hold firmly to those on the boundary of the market area.

To accomplish this, the mill would need to establish during periods of adequate supply a base price lower than that necessary to obtain a proportionate share of the market. Competitive mills probably wouldn't stand still for this, if they were aware of the objective. However,

Will it be to the steelmaker's advantage to compete for wider distribution or to let the more distant buyers compete for supplies while he serves a local market?

suppose this differential were established. When demand for steel increased to near capacity, the customers of this particular mill would be pinched long before the average customer of the industry. The injured customers close to the mill could do little about it.

Effect of Supply and Demand

A serious depression would surely tempt many steel producers to attempt such a maneuver, if it didn't threaten to precipitate a price war. It could be done. During a serious extended depression the consequences might seem to be so long deferred to both seller and buyer that both would willingly risk future consequences for immediate gain. Ordinarily, it is a characteristic of the buying and selling of steel and many other similar commodities that both marketing and procurement decisions frequently hinge not only upon immediate consequences but on effects which may not be felt for a number of years. This is true only because the price of steel is not set by the open market.

According to the law of supply and demand, steel is underpriced during periods of short supply and overpriced during periods of depressed business. Phrasing this another way, steel is worth far more to the user during periods of short supply than the steel producer charges. During periods of depressed business additional tonnage is worth far more to the steel producer than willingness to reduce the price would indicate. Consequently, there is a constant dealing in futures. Relationships today are usually conditioned by what the relationship might be on the opposite side of the business cycle at some future date.

Supply and demand do not set the price of steel. Prices are far more stable than demand. Grey markets exist in steel today because steel is underpriced according to supply and demand. A grey market can not exist when supply and demand determine the market price. In exactly the same way steel is invariably overpriced with respect to supply and demand when business is depressed. Open market price competition could drive steel prices far below cost during depressions, if real price competition existed.

This stability in steel price almost alone accounts for the bitter resistance to the change from basing point system to f.o.b. pricing. Under the basing point system it was virtually impossible to gain much advantage by price competition. The mill "guilty" of price competition usually gained not a single extra ton. The mere existence of a definite clean-cut bench mark eliminated most of the hope of gain by price competition. With f.o.b. pricing the bench mark disappears and price competition is almost inevitable.

Some day in the future, after several periods of good and bad business, the differentials under f.o.b. pricing between steel producing centers may become established by tradition so that they are accepted generally. When this happens, price stability will return just as it existed under the basing point system. During the interim period there will be considerable differences of opinion concerning the proper differentials between producing centers. Even if certain differentials do become fixed firmly by tradition, however, they will be subject to many forces which were not of major importance under the basing point system. For example, any addition of capacity by a major producer would upset the boundaries between market areas and would necessitate a new period of readjustment.

No New Incentives

If price competition and fluid prices are good, then f.o.b. pricing is good for the steel industry. If price stability and rigidity are preferable, then basing point pricing is preferable.

The period of confusion and adjustment incidental to the change from one price policy to the other may produce temporary losses and gains. These will be due mostly to premature attempts to capitalize on the change in marketing areas.

Thoughtful analysis will indicate that there are no *new* reasons created for a producer to change allocations to any customer. Certainly there is no reason for any steel buyer to lose his source due to the change in price policy. Even though certain steel customers will definitely change source eventually, there is little real advantage to the steel producer in reallocating that tonnage now. In fact, the reasons for such a reallocation have been reduced since the producer's financial incentive has been eliminated.

It is equally true that no *new* incentive exists for a steel user to move closer to a mill. There is likely to be a cost incentive provided under more normal conditions to locate in surplus production areas such as Pittsburgh and Youngstown rather than Detroit or the East Coast. But this is a price advantage only, not an availability advantage. The actual pressure to so locate is definitely less than it once was under Pittsburgh plus.

Tax Policies

In spite of the fact that the entire American economic system is based upon the theory that we do have open competitive pricing, a strong case can be made for avoiding serious price competition in the steel industry under present government regulations.

Open market price competition would mean that prices in periods of scarcity, such as the present time, would be considerably higher than they are at present. This would have a profound effect on inflationary trends which are causing so much concern. The classic economic relationship which says that greater profits bring into being more production capacity would not operate under the rules of the game set up by our present laws. In the first place, labor would demand and be able to get virtually all of the increase in profits. This increase in steel industry wages would rapidly be reflected by similar wage increases in other industries. Even if the steel industry were able to retain profits instead of paying them out in increased wages, it would be forced to pay increased dividends because of the tax provisions which prevent accumulation of excess reserves. Payment of the dividends would be inflationary also. Investment of the increased earnings in additional plants and equipment would not be encouraged because tax laws are so designed that the losses incurred on the facilities during poor years would more than offset any profits that could be earned and retained during the relatively few years that the increased capacity would be put into full use.

Tax laws put a great premium on stability of earnings, even at the expense of stability of production. So there is every reason for the steel industry to seek price stability and to be opposed to a pricing method which could easily prove to be disastrous because of the price competition it would encourage.

Fundamentally, f.o.b. pricing and the price competition which it encourages are economically sound. But to realize the advantages, it would be necessary to sharply change a considerable number of the rules for doing business now imposed upon the industry by the gov-

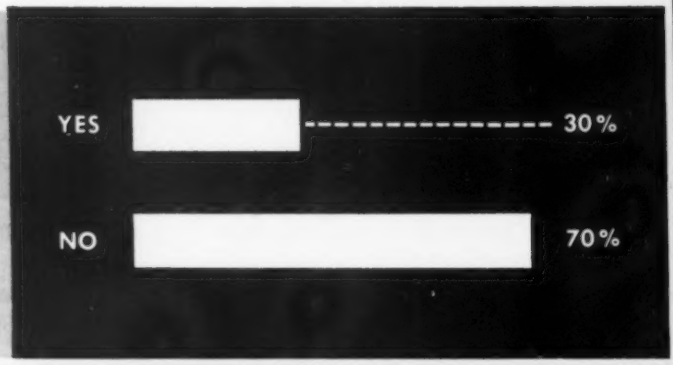
(*Please turn to page* 344)

PURCHASING OPINION

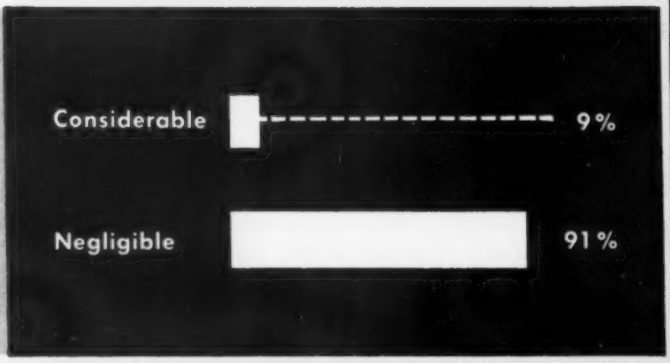
What Is The Fairest Policy For TAXES ON PROFITS?

The President's budget has been submitted to Congress, together with his recommendations for approximately $4 billion in additional taxes to be taken largely from corporation profits. We have asked a cross-section of purchasing agents for their opinions on tax policies generally, their effects, and the soundness of the more widely mentioned tax proposals for meeting increased costs of government in 1949. Their answers, in combined form, follow:

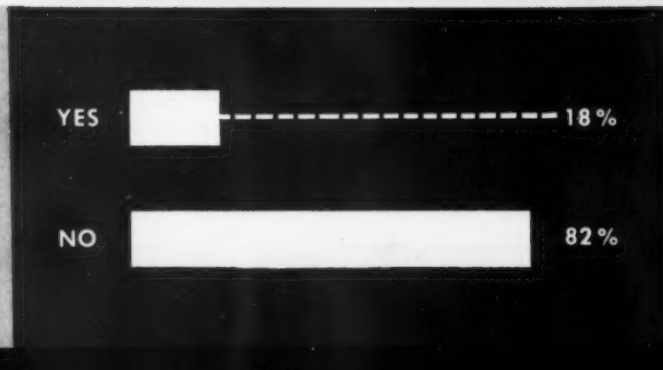
❶ Taxes on individual incomes (purchasing power) are generally regarded as a check on inflation. Do you believe that taxes on business profit will have the same anti-inflationary effect ?



❷ Would you consider "inventory profits" in your industry as a considerable or negligible part of 1948 earnings ?



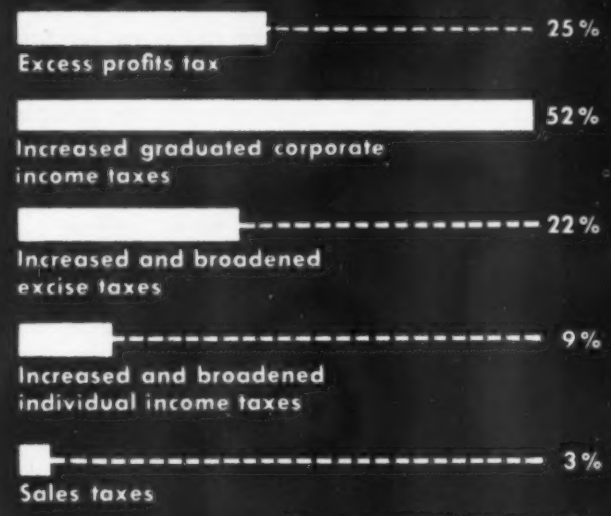
❸ In view of the lower purchasing power of the dollar, do you believe that today's profits can be fairly measured against a previous base period for tax purposes ?



4 In your opinion, will an increased tax substantially reduce the large scale expansion and modernization programs planned by American industry ?

5 Conversely, do you believe that the retention of undistributed profits has encouraged industry generally to overexpand and add to the inflationary spiral ?

6 Assuming that new taxes are necessary in 1949 for increased costs of government and to meet an expected federal deficit of $2 billion, which type of taxation do you consider most sound economically and least liable to curtail production and employment* ?



*Some respondents listed more than one item on this question, so percentage factors total more than 100

WHAT THEY SAY

"Any new tax should be so set up as to allow for a 'normal' increase in capital to promote a healthy growth of business. This would also stimulate establishment of new small business."

"No comment—just disgusted."

"Straight payroll and corporate taxes must replace hidden items. It is the only way the general public will realize the cost of government. Excise taxes do not hurt the wealthy."

"There should be increased taxes on luxury items such as autos, theatre admissions, and any articles not essential to comfortable living."

"Excess profits which are not earmarked for improvement or expansion of a business should be taxable."

"There should be a ceiling on total annual remuneration paid to employees, as well as an excess profits tax. Both of these will compel business to reduce prices as a result of technological advancement."

"Who really understands money?"

"Would prefer less subsidies so that all commodities would eventually drop to a 'standard' level."

"If the government would practice good business management principles, increased taxation would not be necessary."

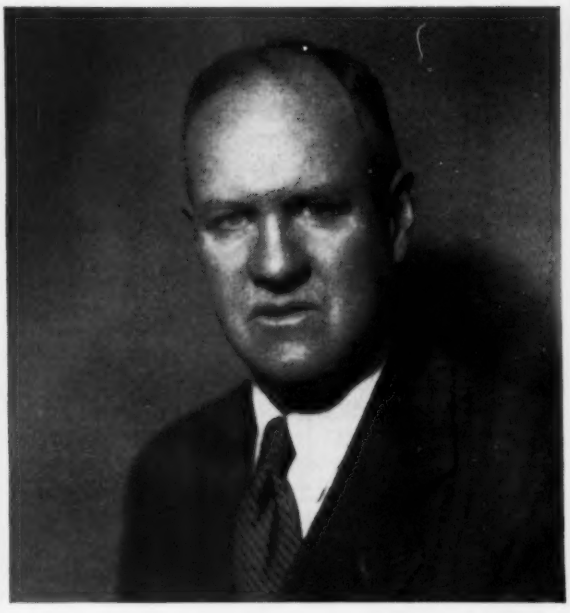
"Adoption of Hoover committee recommendations plus recommendations of Senator Byrd's committee would save more than the estimated $2 billion needed."

"Should have a national lottery."

How Standards are Established

THOMAS D. JOLLY
President, American Standards Association

Mr. Jolly is Vice President of the Aluminum Company of America, in charge of Engineering and Purchasing. He is a past president of the National Association of Purchasing Agents. Purchasing men have a direct and vital interest in standardization projects.



VICE-ADMIRAL GEORGE F. HUSSEY, JR., USN (RET.)
Secretary, American Standards Association

Wartime Chief of the Navy's Bureau of Ordnance, awarded the Distinguished Service Medal for his work in directing the design, production and supply of weapons, was called to his present position in ASA in January, 1948.

ASA represents national technical societies, producing and consuming industries.

Activities include dimension, nomenclature, specifications, safety and building codes.

Three procedures for the development of an approved American Standard.

By Paul V. Farrell

●

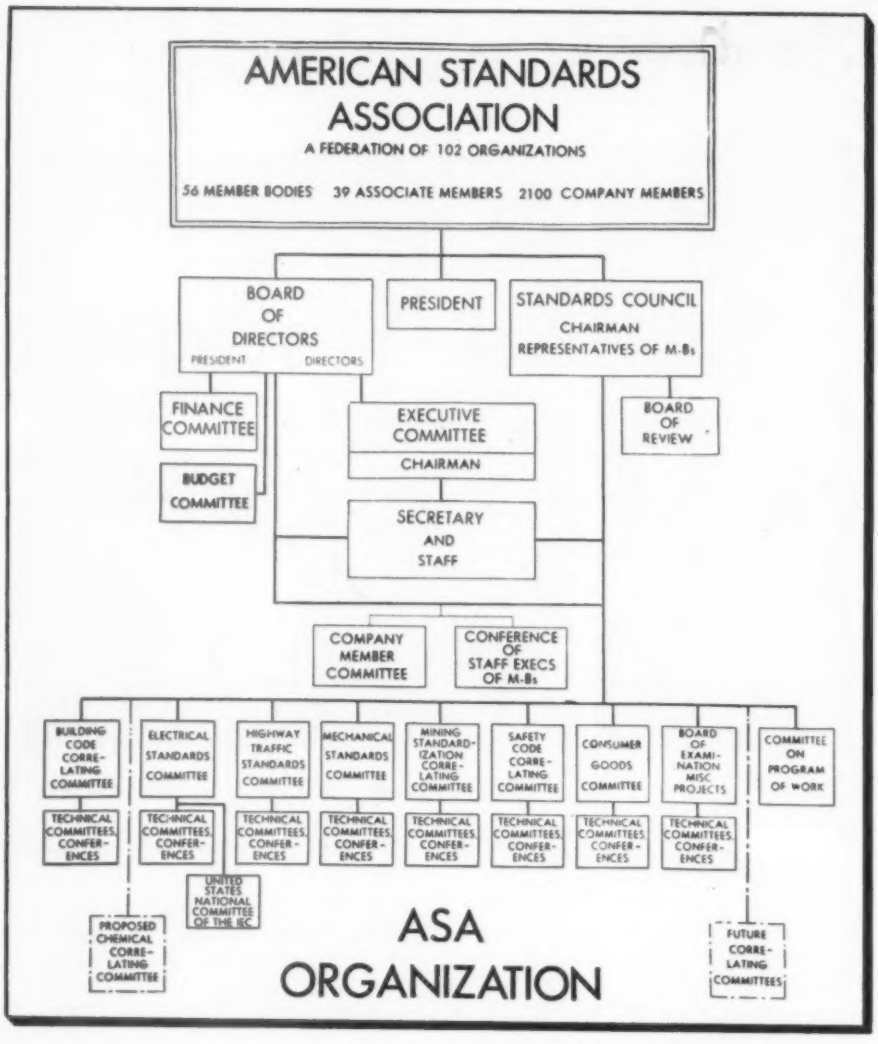
THE average American who buys the same item from a number of sources located in widely scattered areas—whether that item happens to be 51-gauge nylons for his wife or fractional horsepower motors for his company—knows that under normal conditions he can rely on the items meeting his specifications regardless of where they are purchased.

And generally he knows why. Standardization, of course — the standardization that is at the core of our civilization; that makes it possible to send freight over thousands and thousands of miles without re-handling; that makes a red light mean "Stop" in Bangor, Maine, or Oakland, California; that keeps a Berlin airlift operating efficiently over millions of engine-consuming miles.

Where Do Standards Come From?

But because of the very fact that it is so closely interwoven into our daily lives and activities, standardization is accepted as a matter of course, like many of the laws and customs that govern our daily existence. Where do standards come from? Do they "just grow", or are they arbitrarily set up by some omnipotent, anonymous group of scientists and engineers? Relatively few people—industrial men as well as consumers—have any detailed knowledge or appreciation of how a standard is developed, the careful and detailed work expended on it from the time it is proposed to the time it is accepted, and by what authority it is established as an American Standard.

For over 30 years the American Standards Association has been building and perfecting the machinery to develop the standards that will better our way of life and strengthen our form of economy.



Details of 50,000 standards are contained in these files at ASA headquarters in New York City. In the foreground is Eugene Somoff, Technical Service Engineer, who translates foreign standards and arranges for their distribution to interested groups in this country, and makes surveys to determine what technical data is available on any standardization project.

By coordinating the efforts of management, labor, government, technology and the consumer to advance mutually satisfactory and consistent standards, the Association is making steady progress toward the achievement of those aims. Stressing voluntary activity and democratic procedures it carries out its fundamental service to industry, "the unifying and codifying of policy and practice into clear, usable standards."

Organized in 1918 as the American Engineering Standards Committee, with five national engineering societies as members, it served then as a clearing house for coordinating their standardizing activities. The scope of its membership and activities gradually widened over the year. Today it is composed of more than 100 trade associations, technical societies, and consumer organizations, Company Members. By the end of 1948 it had approved 990 American Standards, American War Standards, and American Standard Safety Codes.

Its range of projects alone gives an idea of the importance and significance of its work: dimensional standards to allow for interchangeability of supplies or to secure the interworking of parts of interrelated apparatus; specifications for materials and methods of test; definitions of technical terms used in industry; industrial safety codes to make possible uniform requirements in safety devices for machines and other equipment in the fields of both public and industrial safety; industrial health codes for the prevention of occupational diseases; building code standards; and specifications for consumer goods sold in retail trade.

Development of a Standard

Impetus for the creation of a standard generally comes from a group (manufacturers, technical society, etc.), or a company which desires to see certain practices, functions, or mechanical items made uniform and consistent for most efficient operation of its business. Acting as a meeting ground for informed opinion from all sources concerned—producer, user, and general interest groups—ASA proceeds toward the establishment of an American Standard by three methods: the Sectional Committee Method; the Existing Standards Method; and the General Acceptance Method.

A brief outline of the development of the recently issued American Standard on Surface Roughness gives a good example of the Sec-

tional Committee Method, which is the one most commonly followed in carrying a standardization project to completion. Steps in this type of procedure are illustrated in the accompanying picture-chart.

The American Society of Mechanical Engineers and the Society of Automotive Engineers in 1932 recommended to ASA the development of standards for the designation of surface qualities for use in scientific work and in industry. Through its Correlating Committee on Mechanical Standards (one of a group of eight covering various fields) ASA authorized the project, and a Sectional Committee (B46) was organized. Under ASA regulations, such a committee, containing a balanced representation from all interested groups, may function under the administrative support and direction of one or more of the bodies principally concerned, which are then known as administrative sponsors. Or it may function autonomously provided one or more responsible bodies recommend the initiation of the project and endorse the proposed standard.

Administrative sponsors of Sectional Committee B46 for the Standardization of Classification and Designation of Surface Qualities were the ASME and the SAE. At its first meeting in 1932, attended by about 50 people, the committee appointed several subcommittees to make detailed studies of various aspects of the subject which had a substantial importance in industry. Numerous meetings were held over a period of years, and eventually an executive committee was appointed to review the progress made, to establish a program for future work, and to steer the future activities of the committee. After a long series of meetings the executive committee and its subgroups drew up a standard that permitted within its scope utilization of the practice and principal methods which the various industries and users had found most practical.

The standard was submitted to the Standards Council, composed of official representatives of all Member Bodies for approval; approved; and issued as the American Standard for Surface Roughness, Waviness, and Lay, Part 1, B46.1-1947.

Existing Standards Method

In many cases, national associations have well developed standards programs of their own, and when their committees are shown to be nationally representative and to include all the groups concerned—producers, users and general interest groups—standards recommended by these organizations have a chance of becoming American Standards without going through the sectional committee procedure.

This is known as the Existing Standards Method.

The American Society for Testing Materials is one organization that uses the Existing Standards Method often. ASTM, for example, has a committee on textiles which prepared a large number of standards. Some of the standards were submitted to ASA for approval as American Standards.

ASA examined the voting record of the committee submitted by ASTM, and found that all important producer, user, and general interest groups had had an opportunity to take part in the development of the standards. It noted that no group that had an important interest had voted against them. Therefore, the ASTM standards were given the status of American Standards.

In revising these standards, the American Society for Testing Materials, now known as proprietary sponsor, will inform the American Standards Association that a revision has been completed by its committee. ASA will consider the revision for approval, again assuring itself that the interests of all groups concerned have been observed.

The General Acceptance Method relies on a conference of those substantially concerned to produce a national standard. This method is supplemented by a sufficiently large number of written acceptances of the conference recommendation from those concerned with the scope and provisions of the recommendation. It is principally used for simple projects and for those cases in which ASA feels the appointment of a sectional committee is unnecessary.

The American Standard B48.1-1933 making the conversion factor of one inch equal to 25.4 millimeters for industrial use was the first standard to be established by the General Acceptance Method. The original proposal that the standard be established was made by the Ford Motor Company. ASA called a general conference on the project, attended by representatives of such groups as the Gage Manufacturers Association, Metal Cutting Tool Institute, SAE, General Electric Company, Bausch & Lomb Optical Company, and many others interested in precise measurements and methods of limit gaging.

The conference unanimously recommended this conversion factor—one inch equals 25.4 millimeters—to

HOW AMERICAN STANDARDS ARE DEVELOPED
SECTIONAL COMMITTEE METHOD
ASA
A GROUP OR COMPANY REQUESTS STANDARD
JOB AUTHORIZED BY CORRELATING COMMITTEE SPONSOR APPOINTED
TECHNICAL COMMITTEE FORMED
MEMBERS APPOINTED BY INTERESTED GROUPS
SUBCOMMITTEES DRAFT STANDARD
SPONSOR DISTRIBUTES FOR TRIAL AND CRITICISM
COMMITTEE REDRAFTS STANDARD
COMMITTEE VOTES FOR STANDARD SPONSOR SUBMITS STANDARD TO ASA
ASA COUNCIL APPROVES STANDARD
AMERICAN STANDARD
STANDARD PUBLISHED FOR USE

become the American Standard value for industrial use, replacing for this purpose both the official ratio of 25.40005 and the rounded value of 25.4001 given in certain handbooks and tables. More than 100 organizations were canvassed by the ASA office and a large number of acceptances were received, with no objections. The standard was officially approved.

As a result, American industry secured world-wide uniformity in conversion practice, inasmuch as the British Standards Institution adopted the value 25.4 for industrial use in 1930, after it had been advocated by other European countries.

International Standards

The inch-millimeter conversion points up the cooperation that exists between ASA and foreign standards bodies and the progress that is possible through such cooperation. Manufacturers having plants in both metric and inch countries, who wish to have complete interchangeability of parts regardless of the country in which they are made, can use identical blueprints in the respective countries on the basis of the uniform conversion ratio 25.4.

Representing the United States in international standardization work, the American Standards Association has always made important contributions to the advancement of world commerce, and therefore world understanding. Developments on the international scene since the war, in respect to both business and defense, have highlighted its role in promoting mutual security and fostering more effective trade relations among the friendly nations throughout the world. No better example can be offered than ASA's part in the recent development of standards for British and American screw threads. The implications of such a development for mutual defense alone are of tremendous significance in the present day world.

During the recent war, ASA adopted a short-cut emergency method for the development of standards for defense purposes, and thereby made important contributions to the war effort. Of the 535 standards adopted during the four war years, approximately 85% were directly concerned with the war effort. The method has been discontinued and the war standards are being reviewed to determine whether they should be approved as American Standards, or dropped.

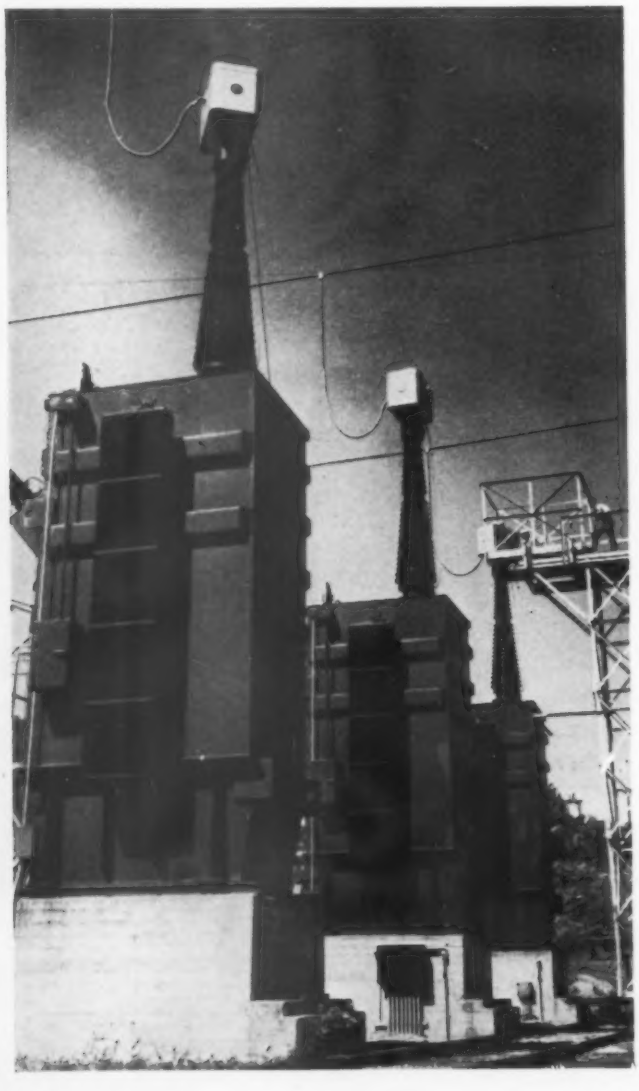
The Organization

To accomplish its self-appointed mission of "providing a systematic means for the establishment of American Standards . . . and thus . . . raise the American working and living standard and protect America's place in a disturbed world", ASA has established the organization outlined in the accompanying chart.

The Board of Directors, whose members are elected upon nomination by selected Member Bodies, handles the general policy, administrative and financial affairs of ASA. The Standards Council, made up of representatives from each of the Member Bodies, has jurisdiction over procedures in the development of standards and their approval.

The Association has a staff of about 85 people working at headquarters at 70 East 45th Street, New York, including technical specialists in every field. Here a library containing some 50,000 standards with related books and materials is maintained for the use of members. Available for distribution and sale at the offices are not only American Standards published by the Association or sponsor organizations, but also those issued by the government and foreign standardizing bodies.

Pointing out that the ASA budget is wholly subscribed by industry and commerce in the form of membership dues, paid either directly by the company member or through a trade association, technical society, or consumer organization, the Association emphasizes that the dues should be understood to constitute a legitimate charge to business expense for services rendered. And through its Board of Directors it is urging industry to recognize that it is to the self interest of business to aid in the development of standards; that each industry should bear its fair share of the cost of operating the American Standards Association to insure its continuous and efficient operation; and that ASA is the channel through which standards of national importance can best be developed by the agencies of free enterprise.



Purchasers and users of electrical equipment are the beneficiaries of continuing work on standards. These giant transformers, built by Westinghouse for the American Gas and Electric Company, raise an incoming voltage of 69,000 volts to 500,000 volts, 70% above the previous maximum (Boulder Dam to Los Angeles). Instruments mounted in the aluminum boxes shown will provide data leading to more economical power transmission.

Good Forms Save Money

By Benjamin P. Hamilton
Facilities & Systems Manager
Piasecki Helicopter Corporation
Morton, Pennsylvania

Efficient office systems are built upon good functional forms and records.

Paper standards, printing processes, and use requirements determine form design.

Six principles for the layout and economical procurement of business forms.

USING the right forms at the Piasecki Helicopter Corporation has reduced form procurement cost by as much as 35%. That is an important saving. Far more significant, however, is the fact that the accompanying clerical work has been reduced by as much as 75%.

We found that the efficiency of engineering release, production control, material control, cost accounting, quality control, and other systems is built upon efficient forms. Additionally, the efficiency of the people who use our forms is materially increased by the basic elimination of waste motions and waste information in the forms that we work with.

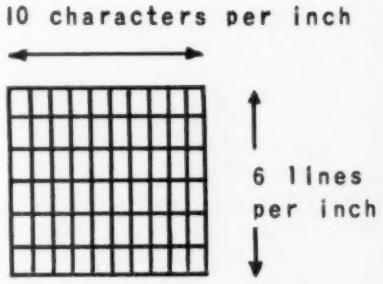
Successful creation of effective forms can usually be accomplished by reference to the fundamental principles of form design that are set forth in the following paragraphs.

First Principle—Select the Right Printing.

Use the type of printing that suits the work you are doing. Forms may be flat printed, continuous printed, or fanfold printed.

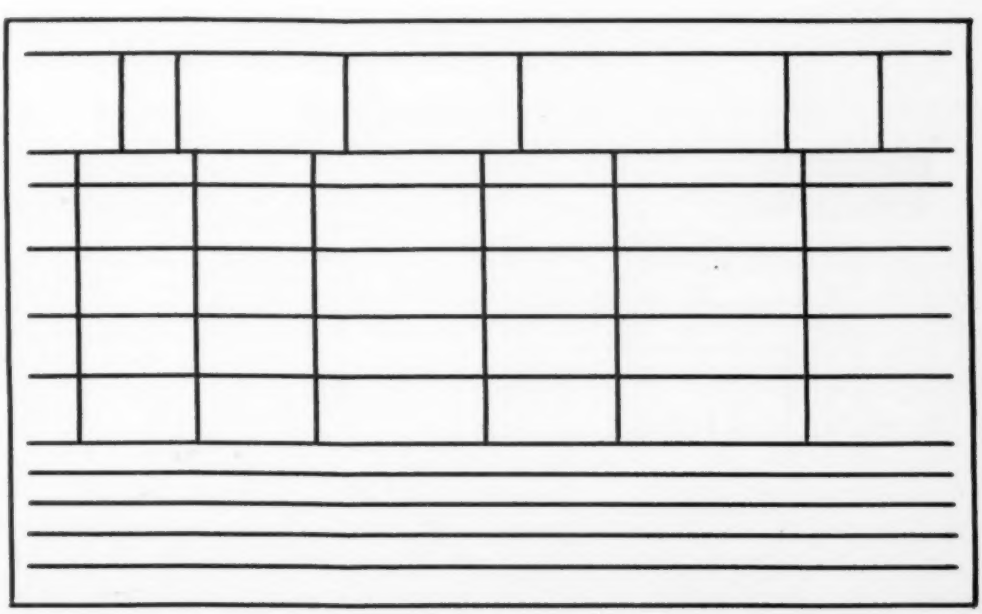
Flat printing — for example, punched cards, letterheads, stock control cards, engineering releases, purchase orders—are single or multiple copy forms used as original records or as transfer records. Flat printed forms may be:

1. Single sheets.
2. Padded sets. (These save by repeated insertions of the same carbon sheets, and may be filled in either by longhand or typewriter.)
3. Snapout sets. (These are interleaved carbon sets, and their cost is higher because of necessary collating and one-time carbon use. This may save money when large quantities are used and when information is added after the original posting).



Sample graph paper with proper spacing for layout of forms that will be typed with pica type.

4. Hecto-Negative Master sets. (These sets are made of master paper hecto-negative carbon and a backer. The press in one operation imprints the front of the master paper and the reverse side receives the plate impression from the car-



Sample form blocked and spaced for typewriter preparation. Careful planning will avoid repeated adjustments of the form in the typewriter carriage and will provide a neater, more legible record.

bon. Using this form when distribution exceeds ten copies will save money, since no retyping is necessary, and blank sheets may be used for all copies.)

Flat printed forms for internal company use are economically produced by hectograph in quantities up to 500; by multigraph or mimeograph, in quantities up to 5,000; or by printing press, in quantities above 5,000. Other methods may be used, but those listed are generally most economical. With limited exceptions (such as quantities of 250 or less per year) mutiple copy form sets should be press printed.

Continuous printed forms are produced on rotary presses. Perforations separating each sheet or set of sheets are arranged so that these forms may be easily separated for distribution. Continuous printed sets of forms may have carbon insertions or carbonized backs. In large quantities, this type of form is less expensive than a flat printed form, and with a single insertion a large number of forms may be filled in on the typewriter or other office machine. Sets of continuous printed forms without carbon interleaving are often used in roll-type register machines that roll the paper through carbon sets; information is manually written to such forms.

Fanfold printed forms are also produced on rotary presses; they are continuous forms with perforations at the top and sides of the form. The carbon cost of typewritten fanfold forms is less, since a fanfold attachment may be used on the typewriter. This attachment uses rolled carbon, and each successive carbon area may be re-used from twenty to thirty times.

Second Principle—Select the Right Size.

Use the minimum size esesntial to the information that the form will contain. In many cases, as much as 50% of form area is wasted by large title blocks, by space allotted to "remarks", or by large margins. This means that a form 8½ x 11 or larger may be used when its purpose could be filled by a 5 x 8 or even a 3 x 5 inch form.

Standard Dimensions

The principle of minimum size should be modified by some other practical considerations. It is valuable to restict forms to a limited number of standard dimensions. For most purposes, the nominal sizes of 3 x 5 (15 square inches), 5 x 8 (40 square inches), and 8½ x 11 (94 square inches) are entirely adequate and provide a space range suited to the majority of requirements. The half-letter size (8½ x 5½) is sometimes desirable when used in conjunction with full-size forms. An important advantage of these suggested standards is that they are best suited to standard commercial filing equipment.

Forms that relate to the same function, and that are consequently commonly filed together, should be of the same size. For example, the materials requisition, purchase requisition, purchase order, and receiving report may well be of uniform size. In general, the use of uniform sizes gives paperwork the appearance of order and careful planning. It facilitates the correlation of key data in corresponding locations on related forms, and makes for ease and efficiency in filing and reference.

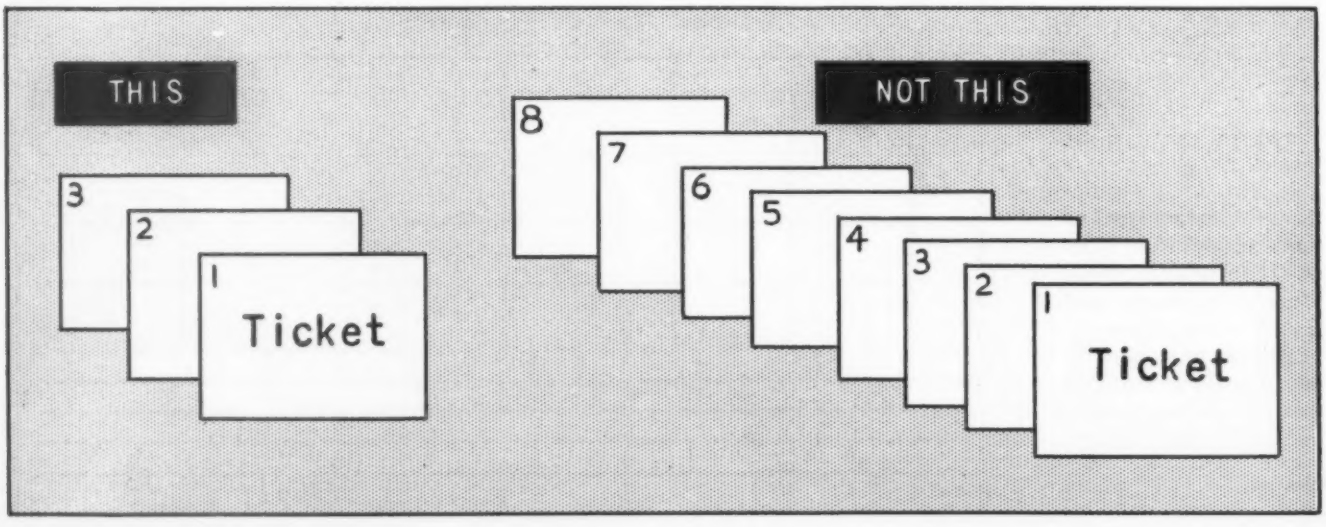
In designing forms to the nominal sizes mentioned, actual size should correspond with paper manufacturers' standards, so that the forms may be cut without waste from a standard size sheet. Forms are usually cut from standard sheets, varying from 17 x 22 to 24 x 38 inches in size. This does not mean, however, that four 8½ x 11 forms can be obtained from a 17 x 22 sheet. In cutting large stacks of sheets, the sizes obtained vary because the sheets fan as the knife descends through them, and an additional trimming may be required. A 3/16" margin must be allowed for a gripping edge if the form is to be printed on a press. This being the case, instead of using the 17 x 22 stock, the printer will use the next larger size, which is 19 x 24, immediately increasing the paper cost of the form. The "trim size" of the form is therefore customarily slightly less in each dimension than the suggested nominal size.

To minimize the paper cost of printed forms, choose your trim size from this list (in inches):

2-⅝ x 4-⅛	5-⅜ x 8-⅜
3-⅜ x 5-⅜	6-⅞ x 8-⅜
3-⅜ x 8-⅜	8-⅜ x 10-⅞
3-⅞ x 6-⅛	8-⅜ x 13-⅞
4-⅛ x 5-⅜	9-⅜ x 11-⅞
4-⅝ x 5-⅞	10-⅞ x 16-⅞
5-⅜ x 6-⅞	11-⅞ x 12-⅜
7-⅞ x 9-⅜	11-⅞ x 18-⅞

It will be noted from this tabulation that the sizes 5⅜ x 8⅜ and 8⅜ x

Multiplicity of form-copies may frequently be the sign of inefficient systems and inadequate flow of information.



10⅞ correspond most closely to the nominal standards for the 5½ x 8½ and 8½ x 11 inch forms, and these are therefore the recommended standards for trim size.

Another size factor is the number of items of original entry to each form. As a general practice, it is best to restrict original entries to a single item. For example, if a purchase order lists several items, the receiving department may require additional supplementary forms to report partial deliveries, or it may use its copy of the order to clear the first item received (supposing separate shipments of the items ordered) and will not immediately find this copy to clear a second shipment. Multiple item paperwork often occasions difficulties in posting, sorting, filing, and locating needed information. For these reasons, it normally saves time and money to use two or more smaller forms in place of a single large form.

Third Principle — Use the Right Spacing.

In drawing up a new form or revising an old one, it is important to know whether it will usually be posted by hand, typewriter, bookkeeping machine, or punched card tabulator. Spaces for handwritten entries should normally be more liberal than for machine posting, for ease of use and legibility of the record.

If the form is to be filled in by typewriter or any other office machine, both horizontal and vertical spacing should correspond with the space movements of the machine. For this purpose, forms are designed using graph paper that cor-

FORMS CHECKLIST

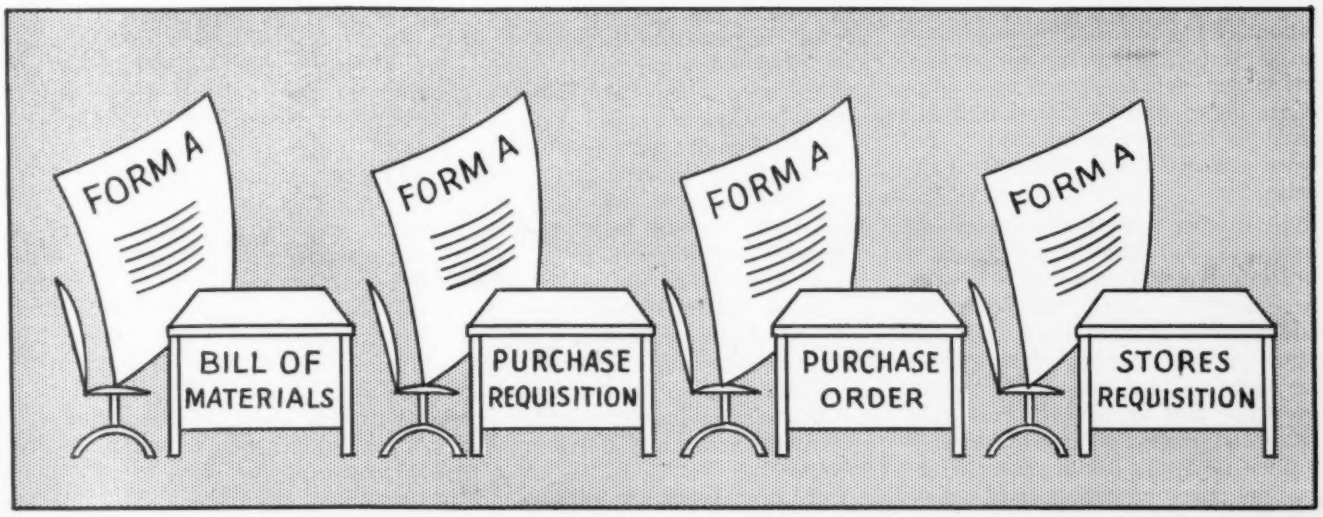
for use in analyzing and revising paperwork procedure

A. Can the form be eliminated or combined?

B. Can the form be simplified?
   1. Is the title descriptive?
   2. Can unnecessary data be eliminated?
   3. Has all available space been utilized so that only one side of the form is required?
   4. Are spaces, blocks, and columns for entering data properly proportioned?
   5. Has "box" styling been used to conserve space and eliminate unnecessary spacing on the typewriter?
   6. Has proper spacing, whether handwritten, typewritten, or tabulated, been used?
   7. Is all recurring information pre-printed?
   8. Should the form carry instructions on its proper use?
   9. Is the item by which the form is filed in the most conspicuous position?
   10. Could a continuous type of form be used to save insertion time of carbons and forms in typewriter?
   11. Could similar forms have standardization information?
   12. Is the data arranged in order of transcription to and from the form?

C. Can we effect printing economies without destroying the usefulness of the form?
   1. If now printed in colored ink, can this be changed to black ink?
   2. If now printed on colored paper, can this be changed to white?
   3. If now serially numbered, can this be eliminated?
   4. If now printed on two sides, can the second printing be eliminated entirely or can it be incorporated on the face of the form?
   5. Can the form be reduced in size, preferably to a standard trimmed size?
   6. Have numbers been substituted for department names?
   7. Have all printed items that are subject to change been avoided?
   8. Have you guessed at the quantity you will require rather than taking the trouble to compute the number of forms that will be used over a specified period of time?

In a well planned system, one form may serve a variety of related functions, avoiding duplication of entries and coordinating the record.



responds with machine spacing. A specimen of such graph paper is illustrated herewith.

All information listings should be blocked to correspond with the maximum space needed by the intended listings. Failure to block out a form properly can result in a crowded, disorderly, hard-to-read form. A simple method that can avoid much future trouble is to lay out the form originally by actual typewriting, thus achieving vertical and horizontal spacing that will obviate the necessity of repeated adjustments of the typewriter carriage when the form is actually in use.

Fourth Principle—Use the Right Number of Copies.

Perhaps the best indication of the efficiency of any system is the number of copies of the forms used in the system. Fifteen-copy shipping memos, ten-copy purchase orders, eight-copy receiving tickets, and twelve-copy shop orders often indicate that ineffective systems are in use. Too many groups may be concerned with each transaction, or the flow of information between groups may be slow and confusing, so that each group requires and uses a separate copy of the original information. In such cases, the system, rather than the form, should be analyzed and revised. Good forms that build good systems are minimum-copy forms. In contrast to the examples cited above, single-copy appropriation requests, three-copy receiving tickets, four-copy shipping memos, and five-copy purchase orders indicate an effective system.

Original information can often be written to a form that serves multiple functions. For example, the bill of material may be written on a form that (1) serves as a bill of material record, (2) with the addition of quantity and schedule information is used as a purchase requisition, (3) with the addition of purchase information as to source, prices and terms, serves as a purchase order, and (4) is additionally used as a stores requisition to release material from stores after receipt.

In another combination, receiving information is added to the purchase order to create a receiving ticket . . . or, processing information may be added to the shop's order to do the work . . . or, shipping authorization may serve as shipping memo, packing slip, and invoice. These and other combinations can considerably reduce clerical work because information once written is used many times over. Effectiveness is determined by the frequency of change normally occurring in the original information, plus the care that is accorded multiple-function form development.

Fifth Principle—Follow the Proper Sequence.

Form design should be standardized so that filing information appears at the same location on all forms. A serial number or a part number or other numerical information in the upper right hand corner is usually the best way to do this. Filed forms may then be thumbed through with the left hand while

The Navy HRP-1 tandem helicopter, built by Piasecki, has proved its worth in rescue work as well as in transport and utility operations on ship and shore.

needed information is entered or listed with the right hand.

Similarly, when two forms are used in conjunction—for example, a requisition and a purchase order—corresponding information should be entered in a corresponding location on the two forms for ease and speed in reference.

Use a sequence in listing information on the form that follows the sequence of the original presentation of the information. By so doing you avoid slipping the typewriter or the writer's hand unnecessarily back and forth or up and down on the form.

For some types of internal correspondence and follow-up forms, ballot-type entries fitted into sequence with other entries are good when a simple yes or no or other preselected answers will serve.

Sixth Principle — Identify Forms Clearly.

For purposes of identification, simplicity is best. A form or a form set may be identified by general appearance, color, size, or title. Copies of a form set may be identified by color, by number, or by name of the department to which the copy is distributed. Sometimes all three methods are applied to each sheet of the set. In this instance, color may be confusing because many people are partially color-blind, or colors change when printers change; or names of departments change; or distributions are changed from department to department.

Identification by general appearance is not enough, since confusion may be caused by different titles verbally and inconsistently applied. Color should be selected as a visual aid only.

The sound rules for identification and color are:

1. Print the title that best describes the form. Abbreviate when possible; if it is a multi-word title, use the initial letters of each word. For example, "OSD Report" is a more usable title than "Overage, Shortage and Discrepancy Report", with no loss in clarity in regular company usage. Don't spend space on the company name for forms used internally. Do print the company name on all external forms, but do so using a neat and compact block at the top left hand corner. In all cases, keep the title block to a minimum size—the form will be recognized and identified by customary users from its general appearance, and a big title is wasted space.

2. Use white paper with black ink for all original entry forms, and buff paper with black ink for all transfer records, including kardex cards, etc. Overprint large numbers as the only distinctive identification of the separate copies in a set.

For ordering and control purposes, each form should carry a company identification number. For this purpose, a block of numbers may be set aside for the forms used by each major business function. No formal code is necessary, but it is helpful if all purchasing department forms, for example, have numbers in the same sequence, with a similar arrangement for sales forms, shop forms, and the like.

General view of the Inventory Planning Branch, Materials Department, American Airlines, Astoria, Long Island.

Inventory Standards and Control

Uniform specifications and nomenclature are basic in controlling stocks and usage.

Prompt decontrol of superseded items avoids purchase of obsolete items.

One master card governs stock lists and the assignment of quantities and locations.

•

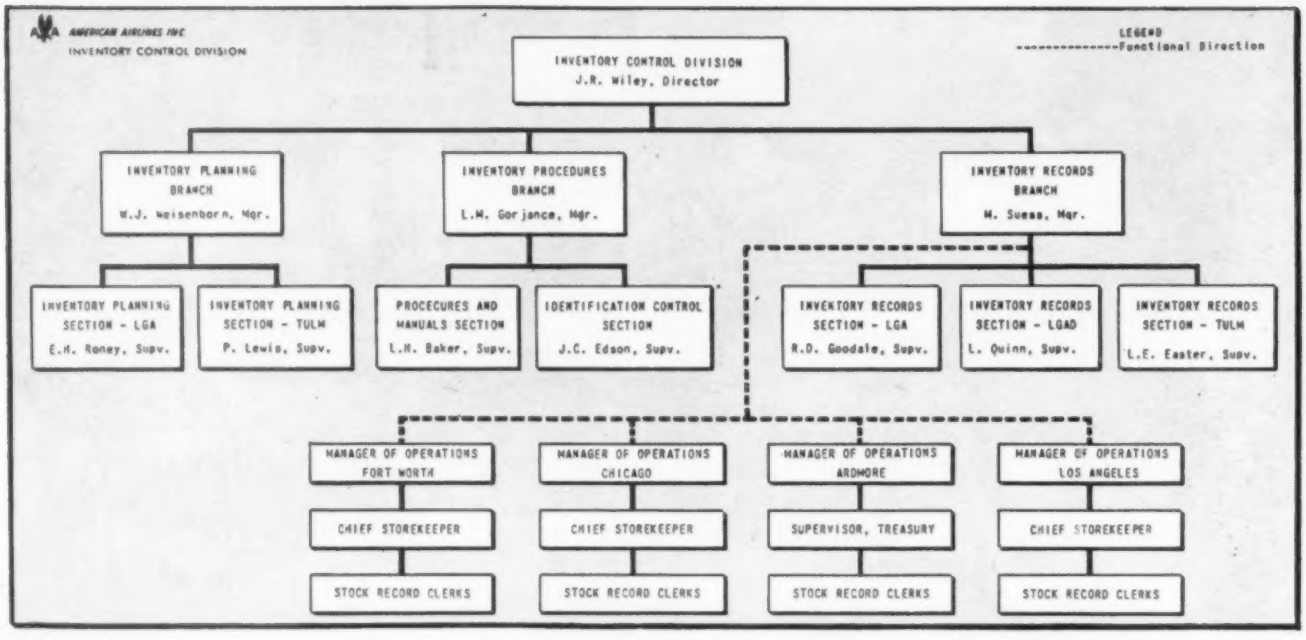
By Joseph Albin

INVENTORY standards — covering identity and nomenclature of items, quantitative limits, policies and records—are essential to any effective system of material control. Although there are many organizations of substantial size and multiplant operations that have no need to meet the requirement of flexibility of disbursements as faced by American Airlines, there is common ground on several of the basic factors involved, and it will be helpful to examine in detail a system that actually works under these exacting conditions.

The materials and parts requirements of this company would be a heavy inventory burden unless certain control mediums had been selectively tried out to eliminate duplications, also to effect reduction of inventory on the shelf at any one time, and to make the operations of requisitioning and transfers direct and unfettered for the personnel concerned.

To accomplish a program with these objectives might seem to suggest a complicated office procedure —a miniature Pentagon of paper workers and files. However, a study of the inventory standardization methods employed reveals that the heart of the system consists of maintaining a master Material Control Card file. Obtainable from this one control medium are stock lists kept up to date and readily applicable to the requirement of inter-station emergency disbursements.

It is doubly necessary to be on guard against duplications since the stock lists are constantly subject to a barrage of changes by engineering specification or by the vendors. Much research went into the system, as will be described here, which was placed in operation at the beginning of 1948. Indicative of the scope of the master plan, as instituted by Materials Department Director G. J. Brandewiede, is the set-up and preparation to make the reproduction of stock lists rest on semi-automatic methods, such as punch card and IBM tabulation sheets, in order to insure completeness and speed in the distribution of the lists to the various stations.



In the American Airlines set-up, standardization is given over principally to the Identification Control Section, a part of the Inventory Procedures Branch, which works closely with the Inventory Planning Branch, responsible for initial provisioning of stock items, establishment of stock levels, and the like. These branches, along with the Inventory Records Branch, are components of the Inventory Control Division, headed by J. R. Wiley, as described in the December 1948 issue of PURCHASING.

Inventory Planning Function

Identification Control takes its cues from Inventory Planning, which carries out specified working relationships with other units of the company. The interactions involved in these relationships may be illustrated in the case of a major type of transaction, such as the initial provisioning of stock items.

The sources of information which Planning consults on such a project include:

- Vendors' catalogs
- Engineering specifications
- Engineering Laboratory specifications
- Requests from other departments (memo or other)
- Spare Parts Change Notices and Spare Parts Service Change Notices as issued by airplane manufacturer.

The immediate activity of Planning under these circumstances is investigational, seeking to determine

L. M. Gorjance, Manager of Inventory Procedures Branch, consults the file of stock identification cards.

the following:

- Nature of usage and location
- Probable consumption
- Date required
- Interchangeability
- Total quantity to be ordered
- Availability or non-availability in present stock
- Control or disbursing point
- Whether items can be fabricated in company shops.

When this information has been collected and analyzed, Planning is prepared to issue instructions on the appropriate forms: to Stores, providing shipping information; to Purchasing, indicating the necessary procurement information; and to Receiving locations, giving advance data on materials being procured.

The requisitions are specific in details and as to actions required. They show such details as delivery schedules based on requirements and forecasts, identification of applicable usage on airplane assembly or engine, increases or decreases in allocations. Action copy goes to the Inventory Procedures Branch to adjust stock lists and/or station spare parts asignments. The responsibility of putting these determinations into effect is then up to the other company units.

The three-fold activity of Inventory Planning—namely, recourse to sources of information, investigation, and issuance of instructions—is similarly applied to transactions for new stock items, engineering releases, obsolete and surplus items, adjustment of inventory levels, initial provisioning of flight equipment, and allocations of rotatable and high cost items.

Identification Control Section

The results of Planning activity are reported to the Identification Control Section on the form known as "Parts Disposition Authority". In the form illustrated, for example, is shown the handling of a change in a conversion kit on the part of the vendor. As may be noted in this instance, Purchasing coordinates

with Engineering to determine on the acceptance of the kit now furnished by the vendor. Conditions are stipulated—in this case, that a service bulletin accompany each kit. Corrections are finally noted on this form.

The Identical Control Section processes this information by reporting the above case as a part change. It reports to (1) Stores, and (2) Inventory Records. The latter section proceeds to decontrol the superseded part and adjust the records accordingly.

The activity peculiar to Identification Control now takes place, consisting of an identification of the two parts—the part to be changed, and the superseding part. The tie-in is done on the Material Control card. The change is shown on the face of the card, and on the reverse side is shown the source of the specification. There is thus accomplished: definite system decontrol of the old item and the providing of the proper current specification and identification of the superseding part through publication in the Stock List.

At appropriate periods, all changes in specifications, additions and deletions of inventory items are reported on the Stock List form.

The Basic Record

For major items, the Material Control Card is also used to indicate allocation of spare parts to the various stations, by means of stamping the information on the back. A card so stamped is designated as Station Spare Parts Assignment Control. This card is supplementary to the regular Material Control Card; its purpose is to show current stock allocations to all stations. The changes are consolidated and published in the Spare Parts Assignment Manual.

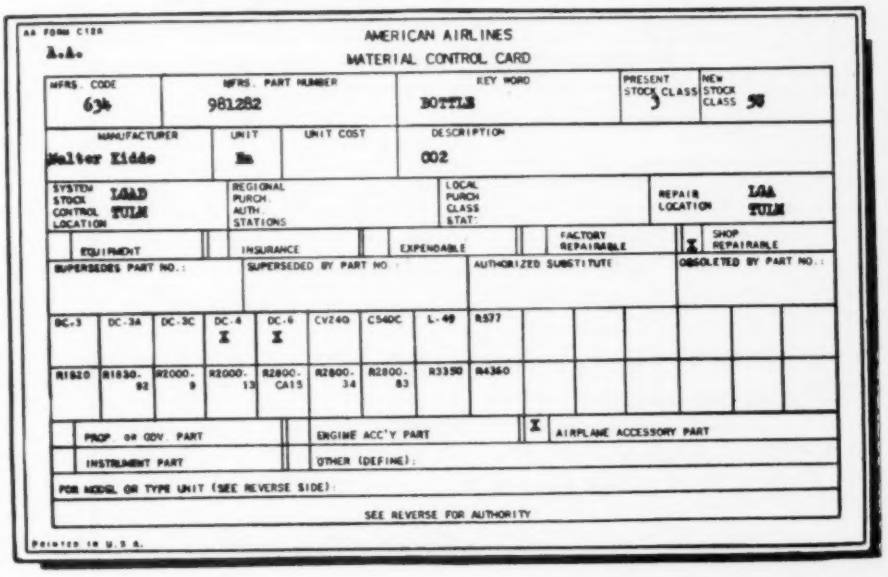
The cards have been designed so as to help check actual practice throughout American Airlines operations—in maintenance, engineering, manufacturing, purchasing, and stores. They are a means of establishing interchangeability of parts. All reports of supersedures and obsolescence are checked against the card.

To get the Material Control Card system started, information was picked up from all sources, wherever available. The information came mainly from (1) stock record cards, (2) maintenance manual lists, (3) Planning Section provisioning lists, (4) Engineering Department specifications. In addition, useful data were secured from manufacturers' publications, such as the "Spare Parts Usage and Surplus Data Book" of the Douglas Aircraft Company, and the "Quarterly Consumption Reports" and "Interchangeable Parts List" of Pratt & Whitney.

The determinations derived from the card system are reflected in the Stock List and the Spare Parts Assignment Manual, specimen pages of which are illustrated herewith. Parts are classified for ease of reference, and are clearly identified by description, part number, and a code indicating the manufacturer. The control point to which orders are to be sent is indicated, as is the repair point for each items. A new part or a change in allocations is indicated by an arrow in the margin; supersedures are indicated by the letters SS. This standarization on stock classification, nomenclature, and official part number is done by the Identification Control Section. It is made effective throughout the system by publication and distribution of the Stock List and manual. Each station where stock is maintained receives a copy of the Spare Parts Assignment Manual, listing the rotatable and more expensive "insurance" parts which they may have occasion to call for.

In columns at the right hand of the sheet are shown the various planes or models to which each part applies, automatically indicating the interchangeability of parts. In the bottom section is a tabulation of the quantity of each item assigned to a specific station. Under ordinary

The Material Control Card is the basic record showing current specification, usage, and allocation of stock quantities of each major item.


AA FORM C12A

AMERICAN AIRLINES

MATERIAL CONTROL CARD

MFRS. CODE	MFRS. PART NUMBER	KEY WORD	PRESENT STOCK CLASS	NEW STOCK CLASS
634	981282	BOTTLE	3	5S

MANUFACTURER	UNIT	UNIT COST	DESCRIPTION
Walter Kidde	Ea		002

SYSTEM STOCK CONTROL LOCATION	REGIONAL PURCH. AUTH. STATIONS	LOCAL PURCH CLASS & STAT.	REPAIR LOCATION
LGAD TULM			LGA TULM

EQUIPMENT	INSURANCE	EXPENDABLE	FACTORY REPAIRABLE	X SHOP REPAIRABLE
				X

SUPERSEDES PART NO.:	SUPERSEDED BY PART NO.:	AUTHORIZED SUBSTITUTE	OBSOLETED BY PART NO.:

DC-3	DC-3A	DC-3C	DC-4	DC-6	CV240	C54DC	L-49	R377							
			X	X											

R1820	R1830-92	R2000-9	R2000-13	R2800-CA15	R2800-34	R2800-83	R3350	R4360							

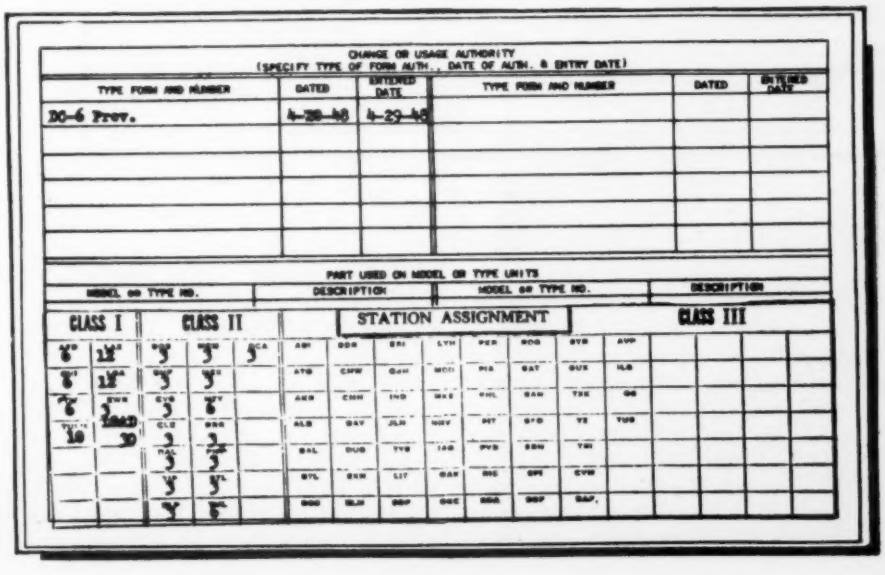
PROP. or GOV. PART | ENGINE ACC'Y PART | X AIRPLANE ACCESSORY PART

INSTRUMENT PART | OTHER (DEFINE):

FOR MODEL OR TYPE UNIT (SEE REVERSE SIDE):

SEE REVERSE FOR AUTHORITY

PRINTED IN U.S.A.


CHANGE OR USAGE AUTHORITY
(SPECIFY TYPE OF FORM AUTH., DATE OF AUTH. & ENTRY DATE)

TYPE FORM AND NUMBER	DATED	ENTERED DATE	TYPE FORM AND NUMBER	DATED	ENTERED DATE
DC-6 Prov.	4-28-48	4-29-48			

PART USED ON MODEL OR TYPE UNITS

MODEL OR TYPE NO.	DESCRIPTION	MODEL OR TYPE NO.	DESCRIPTION

CLASS I | CLASS II | STATION ASSIGNMENT | CLASS III

Specimen page of the Stock List.

The Parts Disposition Authority keeps Stores and using departments informed of any changes in parts standards.

KEY WORD	DESCRIPTION/DISPOSITION	MFR	PART NUMBER	CL	CP	RP	AMERICAN AIRLINES INC.
RESISTOR	510 Ohm 1/2W;SS-390-BT½-500 Ohm	390	BTS	13	LGA		
RESISTOR	510 Ohm 1W;SS-390-BT1-500	390	BTA	13	LGA		
RESISTOR	560 Ohm 1/2W	390	BTS	13	LGA		
RESISTOR	620 Ohm 1/2W	390	BTS	13	LGA		
RESISTOR	750 Ohm 1/2W;SS-390-BTS-680 Ohm;SS-390-BT1-750	390	BTS	13	LGA		
RESISTOR	820 Ohm 1/2W;SS-390-BT1/2-820 Ohm	390	BTS	13	LGA		
RESISTOR	820 Ohm 1W	390	BTA	13	LGA		MATERIALS DEPARTMENT STOCK LIST
RESISTOR	1000 Ohm 1/2W; SS-390-BTS-1000 Ohm	390	BTS	13	LGA		
RESISTOR	1000 Ohm 1W SS-390-BT1-1000 Ohm	390	BTA	13	LGA		
RESISTOR	1000 Ohm 2W	390	BT-2	13	LGA		
RESISTOR	1000 Ohm 10W	L82	BD	13	LGA		
RESISTOR	1500 Ohm 1/2W;SS-390-BTS-1400 Ohm;SS-390-BT1/2-	390	BTS	13	LGA		
				13	LGA		
				13	LGA		
				13	LGA		
				13	LGA		
				13	LGA		
				13	LGA		SECTION:70
				13	LGA		REVISION:
				13	LGA		PAGE: 11
				13	LGA		DATE:7/29/48
				13	LGA		
				13	LGA		

AAL FORM D187A (8-48) 5M 8570 ②

PARTS DISPOSITION AUTHORITY—AAL

TO GENERAL STOREKEEPER

No. DS C17265

FROM SUPERVISOR OF STORES PLANNING DEPARTMENT STORES

CHANGE EFFECTIVE DATE IMMEDIATELY DATE THIS FORM 5-7-47

	PART TO BE CHANGED	PART WILL BE REPLACED BY
PART NUMBER	021279	837692
DESCRIPTION	Kit-Conversion for carbon pile control box	Kit-Conversion Carbon Pile
MODEL AND TYPE		
NEXT ASSY	DC3	DC3
VENDOR	Eclipse Pioneer	Eclipse Pioneer

*QUANTITY NEW PARTS TO BE STOCKED 30 DAYS' REQUIREMENTS COMPLETE CHANGE OVER

DISPOSITION OF OBSOLETE PARTS—CHECK STATEMENT APPLICABLE

☐ PRESENT STOCK TO BE USED BEFORE NEW IS ISSUED ☐ TO BE REWORKED ☐ FACTORY ☐ SHOP ☐ RETIRE FOR DISPOSAL

SPACES BELOW FOR SUPPLY DEPARTMENT USE ONLY

VENDOR	P. O. NO.	P. O. DATE	QUAN.			TOTAL
				MAIN STOCK ROOM	VALUE	
					N. C.	
				SUB STOCK ROOM	VALUE	
					N. C.	
				WARE-HOUSE	VALUE	
					N. C.	

THIS IS IN CONJUNCTION WITH P.O. #180701 dated 2-18-46

*NEW MATERIAL P. D. 4 ATTACHED P. D. 4 NO. 0152558 DATE

ENGINEERING RELEASE NO.

REMARKS

Auth: C2568 #A3666 dated 1-23-46.

Accepted on the proviso that a service bulletin accompanies each kit.

All open requisitions corrected by PD48 D195027.

1—OPEN PURCHASE ORDERS 154342

ON SUSPENSE S. O. AND M. R. O. 2—IN STOCK ROOM

ON SUSPENSE S. O. AND M. R. O. 3—IN MAINT. OFFICE

4—ON OPEN FORMS Col

OTHER EXPENSE ITEMS 5—(EXPLAIN)

TOTAL

DATE 5-7-47 PREPARED BY S.V. Antoinette /s/ AH/JC

DATE STORES RECORDS POSTED BY

DATE 5-7-47 DEPARTMENTAL APPROVAL W.J. Weisenborn

DATE APPROVED ENGINEERING DEPT

NOTE.—ALL COPIES TO BE SIGNED AND RETURNED TO SUPPLY DEPARTMENT.

FINAL DISTRIBUTION OF FORM WILL BE HANDLED BY SUPPLY DEPARTMENT.

DISTRIBUTION:
ORIGINAL: SUPERVISOR OF INSPECTION AND PLANNING.
DUPLICATE: ENGINEERING DEPT. (UNLESS CODE ITEM—THEN TO PURCHASING)
TRIPLICATE: DEPARTMENT CONCERNED.
QUADRUPLICATE: STORES RECORD.

STORES SERVICE LETTER No. 53-57

conditions, a station in need of a certain part orders it from the stipulated Control Point. In case of emergency, a station can determine from the Spare Parts Assignment Manual the station which possesses a supply of the part and which can furnish it in the shortest time.

At present, the Stock List and Spare Parts Assignment Manual are in the form of "ditto" sheets, in a loose-leaf binder. It is planned, as soon as the volume warrants, to change this format by transferring the data on the Material Control Card onto an IBM or other type card so that sheets now manually typed can be reproduced by automatic machine operation. This method is now in the pilot change, pending the change-over. The system will also supersede the more cumbersome method of informing stations of changes by correspondence. When changes occur, Identification Control will merely run off a fresh printed sheet from the card record, and send copies to the various stations, where the old sheet will be lifted and replaced by the new one.

Negotiating for Standardization

Where a problem of duplication exists, the method of standardization is worked out in cooperation with the using departments and with Engineering. Coordinated efforts are needed in working on nomenclature and quantity determinations of items. At American Airlines, this activity of "negotiating for standardization" is usually accomplished at scheduled meetings, assembling for stock listing purposes those items of general inventory having a similar usage.

Usual practice is to use the vendor's number in identifying a part, supplying a code number as prefix to the part number, indicating the particular manufacturer. Similarly, the key word used by the manufacturer in describing his product is also used. This sometimes becomes impracticable in cases where the source of procurement is varied. In these cases, key word and nomenclature are coordinated with Engineering for standardized practice. When

SECTION 10: AIRFRAME PARTS — MATERIALS DEPT. — REVISION #1

ITEM	KEY WORD	DESCRIPTION	MFR.	PART NUMBER	CL	CP	RP	DC3	DC3A	DC3C	MC4	DC6D	DC6S	C72J0	149	C5L0C	B377
1	GATE	Assy Fwd RH	270	5339432-10	61	TULM	TULM					X	X				
2	GATE	Assy Fwd RH	270	5339432-20	61	TULM	TULM					X	X				
3	GAUGE	Water Tank	270	2334190	64	TULM	TULM					X	X				
4	GAUGE	Assy Alcohol Tank	270	4333826	61	TULM	TULM					X	X				
5	GLASS	Corner Window Inner	270	4245210	61	TULM	TULM					X	X				
6	GUARD	Emerg Exit Handle LH	270	4321989	61	TULM	TULM					X	X				
7	GUARD	Emerg Exit Handle RH	270	4321989-1	61	TULM	TULM					X	X				
8																	
9																	
10	HANDLE	Assy Wing Flap Control	270	4332686	61	TULM	TULM					X	X				
11	HANDLE	Assy Landing Gear Control	270	4332687	61	TULM	TULM					X	X				
12	HINGE	Center Rudder Tab	270	2332710	61	TULM	TULM					X	X				
13	HINGE	Front Cargo Door	270	4249134	61	TULM	TULM					X	X				
14	HINGE	Front Cargo Door	270	4249192	61	TULM	TULM					X	X				
15	HINGE	Front Cargo Door	270	4357089	61	TULM	TULM					X	X				

ITEM	SPARE ASSIGNMENT TO STATIONS BY ITEM NUMBER																						
	AFD	BOS	BUF	CHI	CVG	CLE	DAL	YYZ	ELP	FTW	LAX	MEM	MEX	MTY	BRR	EWR	LGA	LGAD	PHX	SFO	STL	TUL	TULM	DCA
1											4												6	
2											4												6	
3											2												2	
4											2						1						27	
5	1			1						1	6						3						10	
6				6							12						30						72	
7				6							12						30						72	
8																								
9																								
10											1						1						2	
11											1						1						2	
12											5												2	
13				2						1	6						3						8	
14				1						1	6						3						8	
15				2						1	6						3						8	

(4-20-48) 7-6-48 — SPARE PARTS ASSIGNMENT MANUAL — PAGE 6

Specimen page of the Spare Parts Assignment Manual.

specific standards are established, they are generally identified by an American Airlines specification drawing.

Duplication is avoided by cross references, and by the immediate decontrol of any superseded parts in the record. In the event that superseded parts are to be utilized until the stock is depleted, the part is shown in the Stock List in cross reference with the superseding type.

Eliminating Obsolete Items

When an item is depleted by use and no longer carried in stock, or if it is declared obsolete, it is removed from the Stock List. Items declared obsolete are reported promptly to Surplus Sales for disposal. In reporting supersedence to Inventory Control records, the superseded item is decontrolled by so indicating on records and cross-referencing to the new part accepted as the current standard. The quantity control medium is eliminated from the record and referred to the new part, so that purchase action can be taken only on the latest specification. The change is confirmed by appropriate listing in the Stock List which gives final part number and name.

Procedure for the avoidance of duplication in connection with the disposition of obsolete parts is as follows. On receipt of the Parts Disposition Authority form stating immediate retirement and disposal of the superseded part, the information is consolidated in the form of a service letter and circulated to Stores and Inventory Record locations for immediate action.

At Stores locations, this action consists of reporting physical quantity on hand directly on the letter, which is then returned to the central office. Here the letters are consolidated and quantities are reported to Surplus Sales for elimination.

Inventory Record action consists of eliminating the quantity control reference for the item, cross-referencing to the new specification, and marking the Stock Record card (by stamp) to indicate obsolescence. This eliminates any possibility of replenishing stock of an item that has been officially replaced.

A modification of this method is now being prepared, and will be put into effect in the near future. As is now the case, actions are reported by the "service letter" system, which is cumbersome at best and open to other objections. In the new procedure, the Parts Disposition Authority form will be changed from carbon to "ditto", and applicable provisions indicated directly on that form. Copies of this revised Parts Disposition Authority will be mailed by Inventory Planning directly to the locations where the material is stocked, for needed action requirements. Copies of the same disposition form will be received by the Identification Control Section and will be tied in with the Material Control card for adjustment of the Stock List and Spare Parts Assignment Manual.

Information from Material Control Cards is transferred to IBM records for distribution to Stores locations.

New Unsheathed Crate Design

● **By George E. Henry**

Lumber savings up to 40% are made possible by diagonal braced construction.

Performance is comparable to that of wholly sheathed crates of the same size.

Panel assembly permits prefabrication of members, demountability, and re-use.

A NEW type heavy duty unsheathed crate, the construction of which requires from 30 to 40% less lumber than fully sheathed crates and yet, according to tests, is comparable in performance, has been developed by the Forest Products Laboratory, Madison, Wis.

Not only do the structural features of the new design make possible a substantial saving in lumber, but the crate is easy to build and can be used for a wide diversity of heavy products that do not require the protection of complete enclosure.

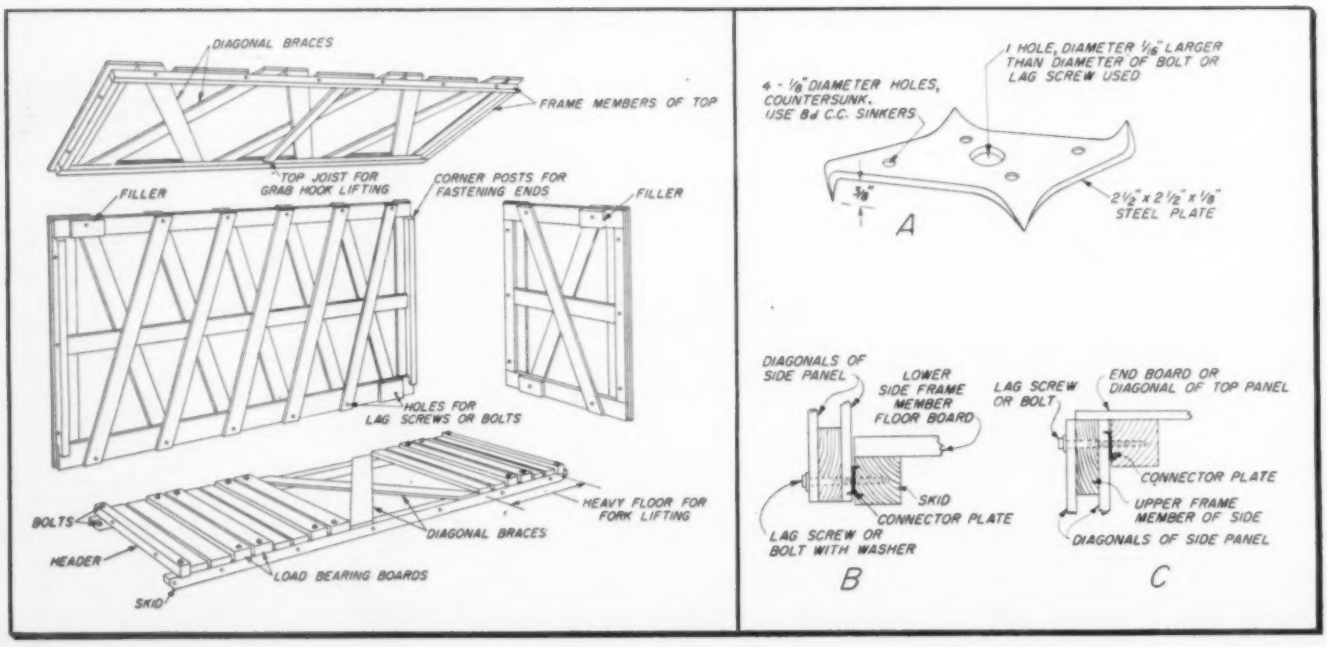
The new crate is of the demountable type and was developed in collaboration with the packaging branches of Army Ordnance and the Army Air Force. Extensive tests of crates up to 40 feet long with loads up to 26,000 pounds have demonstrated the practicality of the design.

The new design is distinguished from conventional crate construction by the employment of two series of diagonal members in the side and end panels, one of which is placed on the outside of the horizontal frame members and one on the inside, the two series sloping in opposite directions.

This construction is revealed in the exploded view of the crate which shows that the diagonal members are nailed to the horizontal members at each point of contact. Of especial interest is the fact that they are so designed and spaced as to obviate the need for vertical struts or other members to support superimposed loads or to resist stresses that may be encountered while the crate is being lifted or handled. This is partly accomplished by the placement of the diagonals at a steeper angle than is ordinarily recommended for smaller crates, or other styles of large crate construction. The number of diagonals in the new crate depends upon the potential superimposed load and the minimum spacing necessary for bolts or lag screws. With the vertical cross section of each panel being symmetrical, the lateral stability is increased, yet its resistance to load and its rigidity are increased.

According to Laboratory engineers, the top panel of the crate shown in the exploded view may be considered in more conventional design. It was found that in the crates tested, diagonal members were not needed on both faces of the frame members of the top. However, it is stated that they may be used to advantage in the tops of long narrow crates to supply rigidity

Exploded view showing details of construction of the demountable type unsheathed crate. At right: Connector plate and lag-screw or bolt assembly. The plates are used on inside surface of side panels at each bolt or lag-screw fastening. Their use decreases the number of fastenings by approximately 50%.



when such crates are handled flatwise.

It is pointed out that a saving in space is effected by this particular design incident to the elimination of load-bearing top joists such as are used in fully sheathed crates. Further, it is stated that the joists are omitted because the open type construction does not readily permit stacking of loads on top of the crate unless dunnage is provided to carry the weight to the side and end panels.

Midway in the length of the top panel, a joist has been provided for resisting the pressure of grabhooks used in lifting the crate. Obviously this should be located in the center of balance of the loaded crate.

Likewise the base is of conventional design, the size and position of the load-bearing floor boards being dependent upon the type and weight of the product that is to be shipped. However, diagonal braces are recommended for the unfloored portions. Two-inch flooring is recommended for the end sections if forklifts or similar devices are to be used for lifting the crates. And if the load is to be concentrated in a small area, it is stated that thicker material may be necessary.

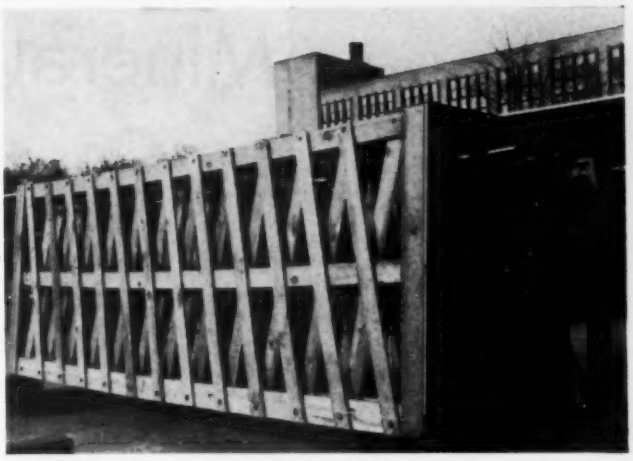
Though the skid sizes recommended by the Laboratory may seem to be rather small, the engineers say that tests show that they may be considered as a part of the side panels when suitably fastened thereto, as the truss construction absorbs a part of the stresses.

The prefabricated panels of the crate are assembled with nails, except for the bolted fastenings indicated in the exploded view. It is explained that where two flat pieces of lumber come together, they should be fastened with nails long enough to pass through both pieces, and the nails clinched. Otherwise, nails should be sufficiently long so that the depth of penetration into the lumber holding the point is twice the thickness of the lumber holding the head of the nail. Nail shank diameters should be such as to minimize splitting.

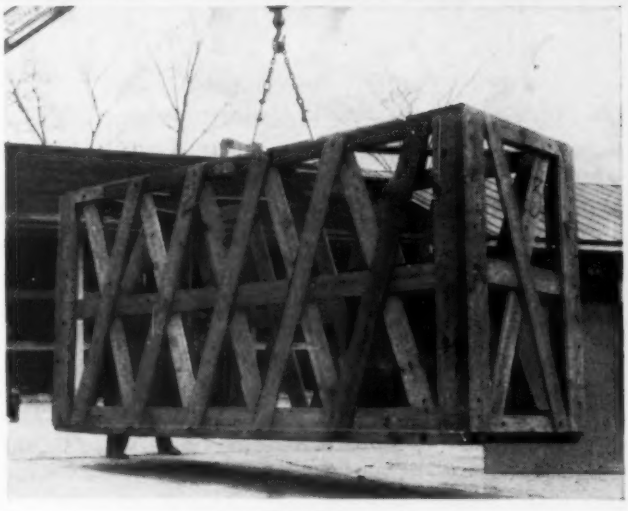
Panel assembly into the complete crate is accomplished either with lag screws or machine bolts. This assembly marks the demountable feature of the crate. It makes possible the reuse of the crates, or possible use of the panels for storage platforms.

The sizes and number of lag screws used was based on resistance to withdrawal and to lateral loads. The engineers report that in tests of crates having very heavy loads, the number of fastenings that would be required for heavy performance appeared excessive. Therefore, to eliminate this factor and at the same time retain the advantage of a lightweight crate, connector plates (illustrated) were used to strengthen the individual fastenings. These plates are applied on the inside surface of the side panels at each lag-screw or bolt fastening. When using the connector plates in carrying loads in excess of 15,000 pounds, it was found possible to decrease the number of fastenings by about half.

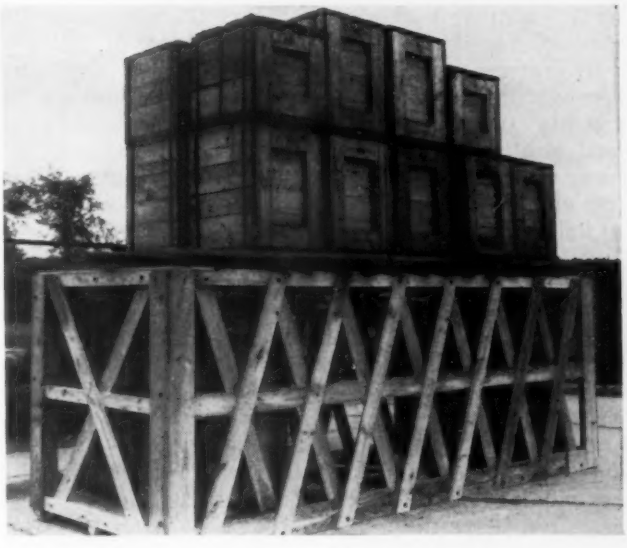
Design data has been developed by the Laboratory for crates for lightweight objects such as airplane wing sections, and for heavier type crates for shipping machine tools and other heavy industrial products.



This crate is 20′ 6″ long by 6′ 6″, and was given corner drop test from height of 12″ with load of 15,310 pounds.



Here a crate is being subjected to the lifting test with grab-hooks applied in center of balance. The crate measured 12′ x 4′ x 6′, and was tested with a load of 2600 pounds, half at each end.



Here a 16′ x 6′ x 6′ crate is subjected to a superimposed load test. The dunnage planks overlap the sides with load equivalent to 400 lbs. per square foot of top area, supported by the side panels. This crate was designed to carry a net load of 8,000 pounds.

Canada's Mineral Treasure Chest

● By *Phil Glanzer*

Canada is the source of 80% of the world's nickel, ranks second in gold production.

More than three-fourths of metals and ores are exported.

Exploration and cheap hydro-electric power needed to exploit remote areas.

CANADA'S splendid industrial record in the late war can be traced in no small degree to the Dominion's strong position as a producer of minerals. The huge scale production by Canadian industry of the munitions of war—a production that was exceeded by only three other Allied countries—could not have been undertaken otherwise.

Because of this strong position as a mineral producer, the Dominion was able to supply the Allied countries with a large share of their needs for such metals and minerals as nickel, copper, lead, zinc, mercury, asbestos and mica.

In reference to the production record, during six years of war Canada produced nickel, copper, lead and zinc to a total value of more than a billion dollars—producing approximately 810,000 tons of nickel, 1,800,000 tons of copper, 1,600,000 tons of zinc, and 1,300,000 tons of lead—and exporting over 76% of this total output.

To meet the needs for the nonferrous base metals, plant facilities had to be greatly extended, even with the curtailment or elimination of use in civilian products. Production rates soon increased well beyond those of the peak pre-war years. One of the greatest accomplishments on the Canadian industrial front was in the production of aluminum. From a prewar annual production of less than 29,750 tons of primary metal, output has been stepped up to over half a million tons per annum by the end of the war period.

Depletion and Reserves

Long before the War had ended, the matter of the mining industry's outlook in the postwar years was engaging the attention of those concerned with its welfare. Already mining had shown a remarkable growth, but this growth was more evident in annual production figures than in an increase in physical assets as represented by the disclosure of new sources of mineral supply.

Mining has problems of its own, particularly the problem of depletion. Unlike agricultural or forest products, ore has no roots. If you mine a pound of gold ore, it will not be replaced, consequently economists call mines "a wasting asset". The fact that the known reserves of most of the principal metals are large was comforting knowledge only to the extent that there was no particular cause for concern for the next several years. The wasting asset angle, however, can never be overlooked in an industry like mining, and it was recognized that every effort would be needed to stimulate prospecting and exploratory activities.

As had been expected, there was a substantial decline in the demand for most products of the mines following the cessation of hostilities. This caused no great concern, as there were indications that the decline was temporary in nature and that it would be followed in due course by a rising demand for these products.

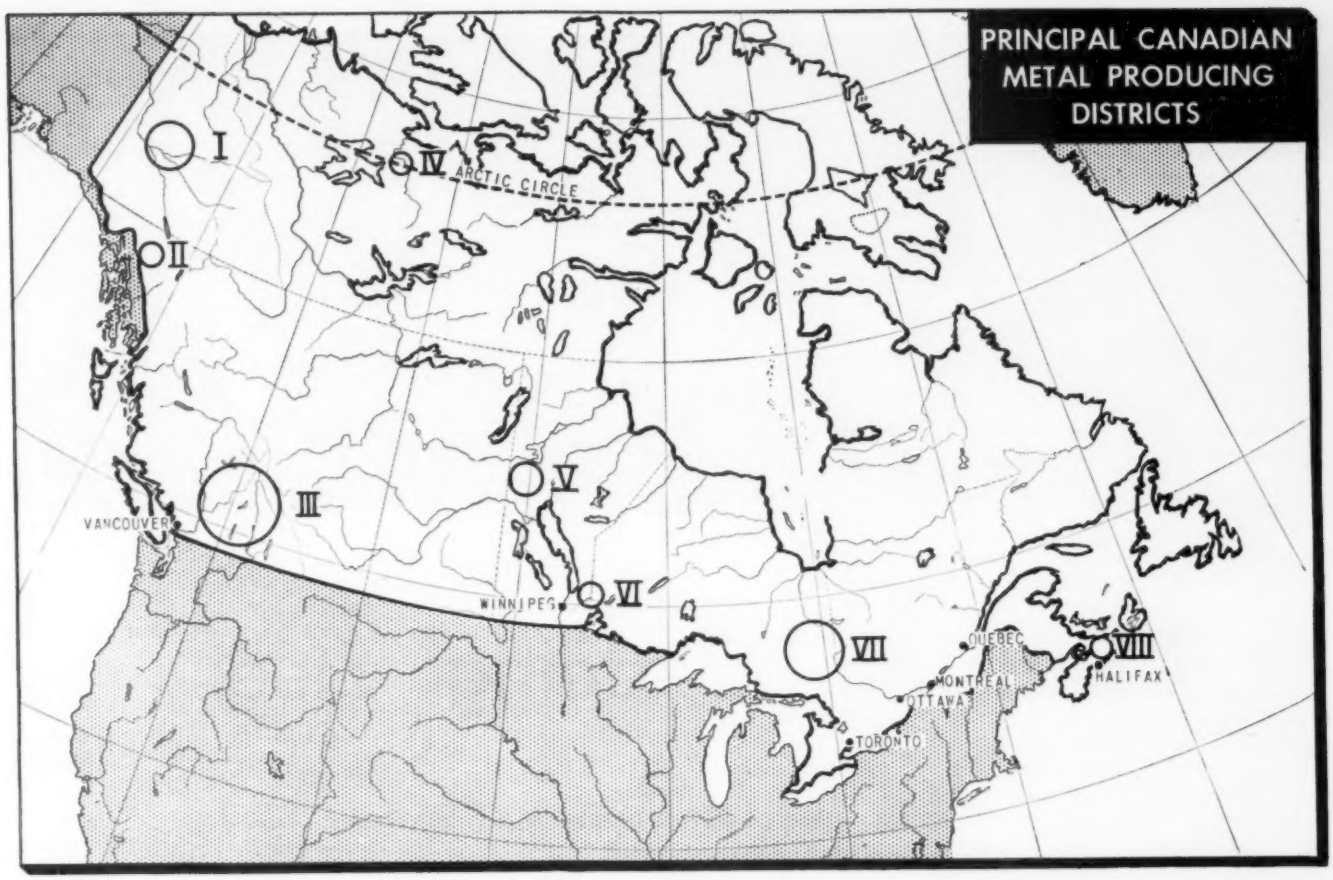
It is well to keep in mind, however, that forecasts made at an early stage in the reconversion period are almost unavoidably influenced by what might be described as mass reaction resulting from a long period during which goods and services were in short supply. Thus the demand may level off when it is realized that production is again fully under way and that requirements can be obtained without difficulty.

Dollarwise, since 1930, gold has been the greatest single contributor to the Canadian mineral output. Production reached a peak of 5,345,179 fine oz. valued at $205,789,392 in 1941. Owing to wartime restrictions it declined steadily until the late summer of 1945, the output for that year amounting to 2,661,567 fine oz. valued at $102,470,330. Canada, however, has continued to hold second position as a gold producer, being exceeded only by South Africa.

Little comment is needed as to the importance of gold mining to the national welfare of Canada, for few industries have contributed more toward the strengthening of the Canadian economy. Prior to 1931, when the price of gold began to rise, the major operations were confined mainly to the Porcupine and Kirkland Lake camps in Ontario. The price continued to rise until January 1934, when it was fixed by the United States Government at $35.00 per ounce. Since late in 1939 the price in Canadian funds has been $38.50 per ounce, mainly due to the depreciated dollar. However, on July 1, 1946, Canada brought its dollar up to par with the American dollar, with the resultant price of gold remaining $35.00 in both countries. This situation automatically called a halt to gold-mining operations in Canada. While mining companies produced a very small quantity of gold, this was kept and is still being kept in storage pending the possible price rise in gold.

In order to induce mining companies to dispose of their gold hoard, and to encourage further mining, the Canadian government offered a bonus to producers. In other words, all extra gold output above that turned out in the year ended June 30, 1947, will receive a $7 an ounce subsidy from the Canadian government for a three-year period.

Most of the big producers of the Porcupine and Kirkland Lake camps



PRINCIPAL METAL PRODUCING DISTRICTS IN CANADA

(Percentage of total national production)

	Gold	Silver	Lead	Copper	Zinc	Radium	Nickel	Platinum
I. Dawson—Mayo	1%	16%	1%					
II. Atlin—Stewart	2%	4%	some					
III. Howe Sound—Barkerville—Kimberley	9%	42%	97%	12%	70%			
IV. Great Bear Lake		2%				100%		
V. Flin Flon-Sherridon	3%	9%		14%	19%			
VI. Beresford—Kenora—Red Lake	7%	some						
VII. Porcupine—Noranda—Cobalt—Sudbury	74%	26%		73%	7%		100%	100%
VIII. Nova Scotia	Some	some	some	some	3%			

will unquestionably strive to increase output to participate in the benefits of the new government program. Mines such as Kirkland Lake Gold Mining Co. and Macassa, which are well supplied with higher grade ore, may conceivably make remarkedly good showings. But other properties, where development still lags, may find it difficult to reap any great improvement in revenues from the gold incentive program. In certain instances where production has been dropping over a period of years, it is conceivable that assistance of some other type may be required if output is to take a turn for the better.

The outlook for the Canadian gold mining industry from the long range viewpoint is more difficult to appraise, particularly as the price of the metal in relation to taxes, salaries, wages, and the prices of commodities, has a bearing on the future of the industry. The extent of the known reserves is an important factor, and in this connection it should be noted that most of the long-established producing mines, in particular those in the Kirkland Lake and Porcupine areas, are in a position to continue operations at the prewar scale for several years.

In the search for new sources of gold much attention continues to be given to the older areas, large portions of which are overlain by glacial drift of considerable thickness. Geophysical methods of prospecting will be used to an increasing extent in determining the possibilities of such areas. In the outlying areas, interest has been greatly stimulated

(*Please turn to page* 346)

Clad steels have a wide variety of application — in refrigerator cars, refinery equipment, process industries, food service counters, tanks, kettles, household appliances, and architectural units.

Facts on "Cladding" Steel

Composite metal plates combine advantages of diverse components.

Cladding process results in a permanent bond between metal surfaces.

Clad steels have a wide range of useful product applications.

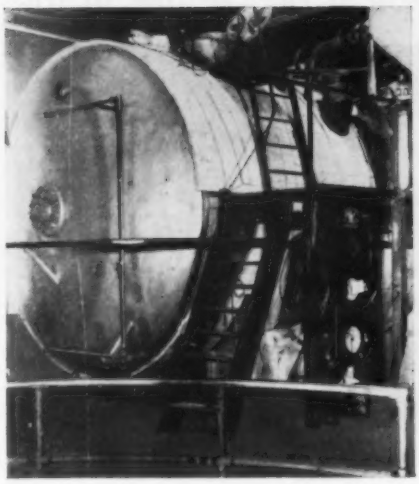
● ***By Benjamin Melnitsky***

THE past few years have witnessed startlingly new developments in the field of composite engineering materials. Copper joined to mahogany, aluminum to plywood, steel to glass, metal to non-metal as well as metal to metal—these and other combinations are not at all uncommon. In many instances the bonding processes — electroplating, casting, metal spraying, and using adhesives—are time-tested means for joining metallic and non-metallic materials. However, certain of the other bonding processes now in use are in many ways revolutionary developments which have opened a path to hitherto unexplored fields of industrial endeavor. One of the most remarkable and significant of these is employed in the production of the many types of clad steels now on the market.

Because the advantages of clad steels are so obvious and their possible uses so numerous, it can be stated with certainty that the immediate future will see significant increases in the production and use of this combination metal form. Some inkling of the advances made by these clad steels can be seen from the accompanying list of typical applications for stainless-clad carbon steels.

"Cladding" can be defined as a method wherein two ferrous metals or a ferrous and non-ferrous metal are permanently and homogeneously bonded together to form an engineering material with many of the advantages of both. For example, by cladding stainless to carbon steel there are obtained the corrosion resistance and attractive appearance of one plus the lower cost and better heat-dissipation properties of the other. Cladding nickel to carbon steel results in a finished product with the corrosion-resistance of nickel at the lower cost of clad steel. By cladding silver to steel, the high thermal and electrical conductivity of the higher-cost metal can be utilized economically. In addition to stainless steel, nickel, and silver, other metals including copper, Inconel, Monel, brass, and cupronickel are joined to carbon or low-alloy steels. The bond between the two metals is a permanent one. In most instances, carbon or low-alloy steel is used for the backing of the clad product and a more expensive ferrous or non-ferrous metal used for the cladding.

The first major industrial use for clad steel was during the first World War in the production of copper-clad steel bullet jackets. By using the clad metal, which produced a product with all the desired properties of solid copper, the rate of consumption for the scarce non-ferrous metal and the cost of the ammunition were both reduced considerably. The first nickel-clad steel was manufactured in 1930 and used in the con-



struction of railroad tank cars designed to carry caustic soda. In 1934, Inconel-clad steel was developed for the domestic champagne industry as a substitute for the glass-lined steel vats and tanks that were used hitherto.

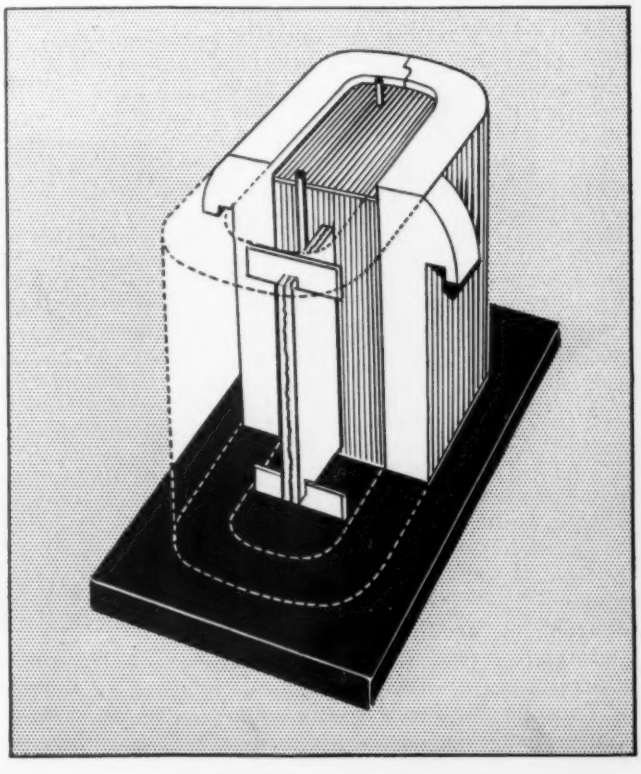
Despite restrictions in the construction of cladding equipment and the development of mills designed to roll this special product—both brought on by World War II—production figures for clad steels have increased annually. One producer of stainless-clad steel estimated recently that his production in the near future would be in the neighborhood of 120 tons daily. Since the lifting of wartime restrictions, many new fabricators have entered the field and many others are preparing to follow suit.

Clad steels differ from other composite metals not only in production methods but also in the nature of the finished product. In almost all other bonding methods, the adhesion of components is a mechanical one. However, in cladding there is a true chemical and physical combination, the result of intense heat, pressure and a rolling operation, as illustrated in the accompanying series of photographs.

These photographs show a 4-ply pack or "sandwich", producing two plates with cladding on one side only. If, as is often the case, the steel plate needs to be clad on both sides, a 5-ply pack is used. This "double-decker sandwich" consists of alternate plates of the cladding metal and the backing steel, and, after processing, produces two plates of unclad steel plus one plate clad on both sides. Similarly, a 7-ply pack results in two steel plates clad on one side and one plate clad on both sides.

The method illustrated has a number of variations, depending on the type of cladding plates used and on other variables. In addition, other processes may be used to produce the clad product. One of these, the "Cast-in-the-Ingot" (Ingersoll patent) process, is shown herewith in diagrammatic form. Two sheets of stainless steel, separated by a parting compound, are inserted in the center of an ingot mold, into which is poured soft steel. When the mold solidifies, it is rolled to the desired thickness. Subsequently, the edges are sheared and the two stainless-clad steel plates are separated. Still other methods entail welding or intermelting different metals.

As can be seen from these descriptions of the cladding process, the method is neither simple nor inexpensive; yet the final cost of a clad metal almost always is less than the cost of the cladding material in its solid state. It was estimated recently that Type 304 stainless steel costing, at that time, 31.5¢ a pound in plate form, would, when bonded on carbon steel, result in a stainless-clad plate costing approximately 24¢ a pound. It is stated by producers that nickel- or Monel-clad strip steel is 30% to 35% cheaper than solid strip and that copper-clad steel is about 25% less expensive than solid



Cut-away diagram of the Ingersoll patented cladding process. Cladding sheets, separated by parting compound, are inserted in ingot mold and surrounded by molten steel for subsequent rolling. (Ingersoll Steel Division, Borg-Warner Corporation).

copper. Of course, it is not entirely fair to compare copper-clad steel with pure copper on a cost basis alone because for many applications the clad product would be inferior. However, in many other instances, not only is the clad steel cheaper but it is also better than the cladding material in its solid state.

Most housewives are familiar with the fact that a stainless steel frying pan does not produce as good a fried egg as a less expensive carbon steel utensil. The relatively poor heat-conducting qualities of the stainless product account for this. However, as the housewife will quickly add, the stainless steel frying pan looks a good deal better, and is much easier to clean. By cladding both sides of carbon steel with stainless, the beauty and cleanliness of the pan, so admired by the housewife, are maintained along with much of the heat conductiity of carbon steel.

Cladding for this type of application is by no means restricted to kitchen ware or frying pans. In the food processing and beverage industries, where the problems of the housewife are magnified tremendously, there is still present the basic need of uniform heat dissipation, and clad products such as described above are used. It is in these and other industries where acids and other corrosive elements are handled that clad steels have found tremendous use. Huge containers, vats, and tanks used in the processing industries were formerly made of steel lined with glass or of solid nickel, copper, stainless, and other of the more expensive and corrosion-resistant metals. By using the clad product, the resistance to corrosion and attacks by atmospheric impurities are still retained; yet the cost of the finished product is considerably reduced.

High cost is not the only reason why there are problems connected with corrosion-resistant metals. Difficulty in enameling is another. The stainless steel tank of the home washing machine is a good example of this. The tank will withstand attack by soap, acids, moisture, and other corrosive elements; yet, it will not take a porcelain enamel coating. Because of this, washing machines were formerly made with stainless steel tanks set into carbon steel frames. The frames were then enameled to match the legs and other exterior parts of the machine. By using stainless-clad carbon steel, and forming the metal so that the stainless cladding becomes the in-

Typical procedure in the

1 First stage is thorough cleaning of the surface of the backing plate that is to receive the clad metal. If stainless steel or Inconel is to be used, the surface is nickel plated.

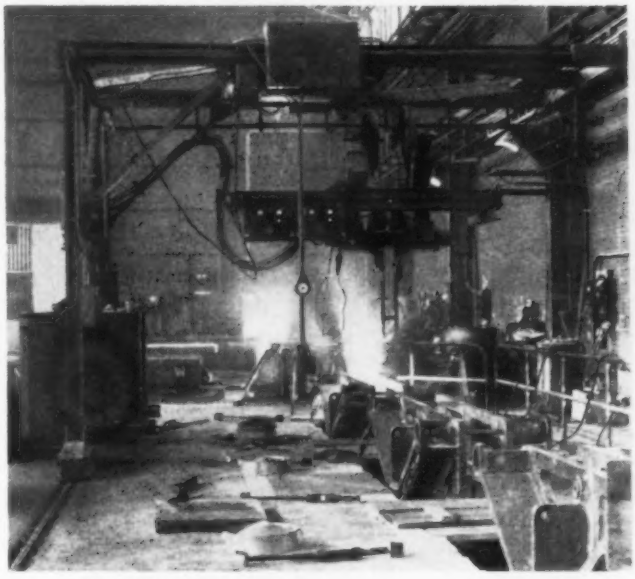
4 Two of these assemblies are clamped together. Steel protecting bars, equal to the total thickness of the cladding plates, are inserted and welded to the two steel backing plates.

7 Heated to temperatures of 2200 to 2350 degrees F, the sandwich is rolled to size in a large plate mill. Heat and pressure form a permanent bond between backing and cladding plates.

production of a clad steel plate *(Photos by Lukens Steel Company)*

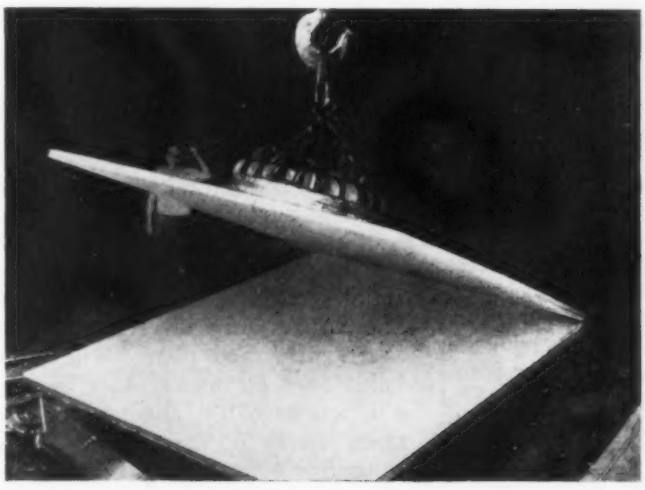
2 Cladding material is placed on the backing plate. Relative thickness of the two materials is predetermined; cladding sheet is slightly smaller than base metal.

3 The two plates are hand welded, and welds are cleaned by wire brushing. A parting compound is then applied to the surface of the cladding plate.

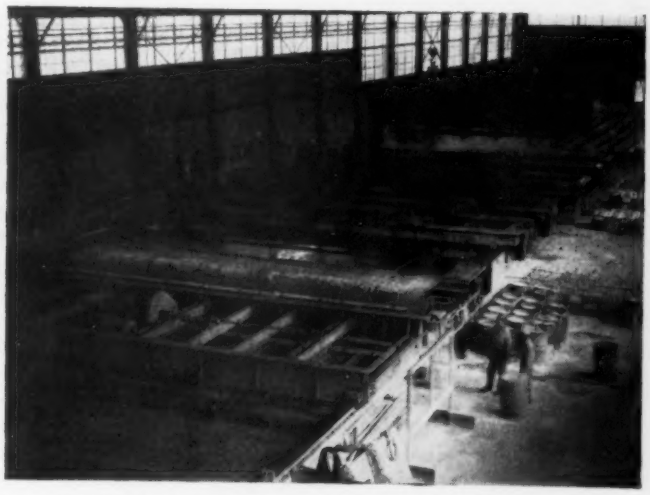


5 The joined slabs are now completely machine welded on all sides to hold component parts together and to occlude gases during the heating and rolling process.

6 The welded assembly—a "sandwich" of two backing plates with a "filler" of two cladding plates separated by the parting compound—is then placed in a soaking pit.



8 After cooling, the welded edges are removed by flame cutting. The two clad plates, which did not combine because of parting compound, are separated by electro-magnet.



9 The clad steel plate (this one is 38 ft. long) is descaled in a sodium hydride descaling plant, assuring a surface that is clean and easy to keep clean.

TYPICAL APPLICATIONS FOR STAINLESS-CLAD STEEL CLASSIFIED BY INDUSTRIAL USES

(as listed by Ingersoll Steel Division, Borg-Warner Corporation)

ARCHITECTURAL:
- Building Trim
- Duct Work
- Elevator Cabs
- Escalator Paneling
- Hoods
- Kick Plates
- Ornamental Marquees
- Paneling
- Shower Cabinets
- Spandrels
- Store Fronts

AUTOMOTIVE:
- Bumpers
- Radiator Grilles
- Trim

BOTTLING:
- Bottling Machine Accumulator Tables
- Hoppers
- Syrup Drums
- Syrup Tanks
- Washing Machines

BREWING AND DISTILLING:
- Agers
- Cooling Equipment
- Fermenters
- Filter Units
- Mash Tubs
- Stills
- Storage Tanks
- Yeast Tanks

CHEMICAL:
- Autoclaves
- Condensers
- Cookers
- Conveyor Troughs
- Drums, Shipping Containers
- Evaporators
- Fume Stacks
- Heat Exchanger Shells
- Hoods
- Hoppers
- Jacketed Vessels
- Laboratory Table Tops
- Mixing Tanks
- Pressure Vessels
- Retorts
- Rotary Dryers
- Stills
- Tank Cars
- Tanks
- Towers
- Vacuum Pans
- Vats

DOMESTIC:
- Cooking Utensils
- Kitchen Cabinet Tops
- Pressure Cookers
- Sinks
- Table Tops
- Work Surfaces

FOOD PROCESSING:
- Cereal Cookers
- Cheese Vats
- Chutes
- Condensers
- Conveyors
- Coolers
- Drums
- Dough Troughs
- Evaporators
- Homogenizers
- Hoppers
- Ice Cream Cabinets
- Jacketed Vessels
- Kettles
- Mixing Tanks
- Milk Storage Tanks
- Packing Tables
- Pans
- Refrigerated Cabinets
- Sorting Tables
- Sterilizers
- Stills
- Table Tops
- Tanks
- Truck Tanks
- Vacuum Pans

FOOD SERVICE — INSTITUTIONAL:
- Back Bars
- Canopies and Hoods
- Chip Ice Units
- Coffee Urn Stands
- Counters
- Display Cases
- Front Bars
- Kick Plates
- Paneling
- Pie Cases
- Refrigerated Cabinets
- Sandwich Counters
- Shelving
- Sinks and Drainboards
- Soda Fountains
- Steam Tables

GOVERNMENT:
- Canal Lock Gate Seals
- Dams, Conduit Liners
- Food Service Units
- Hospital Sterilizers
- Housings
- Laboratory Tables
- Marine Applications
- Operating Tables

PAINT & VARNISH:
- Acid Storage Tanks
- Lacquer Kettles
- Resin Kettles
- Varnish Kettles

PETROLEUM:
- Condensers
- Heat Exchangers
- Tank Linings

PHARMACEUTICAL:
- Hoppers
- Mixing Tanks
- Packing Tables
- Processing Tanks

PULP AND PAPER:
- Acid Storage Tanks
- Blow Pits
- Clay Emulsion Tanks
- Diffusers
- Digester Linings
- Digesters
- Filter Units
- Head Boxes
- Save-Alls
- Tank Linings
- Waste Liquor Tanks

SOAP:
- Crutchers
- Drums
- Processing Tanks
- Soap Frames
- Soap Kettles
- Tank & Kettle Linings

TEXTILE:
- Bleaching Equipment
- Buckets
- Dye Jigs
- Dye Kettles
- Extractor Cylinders
- Kiers
- Laundry Equipment
- Processing Tanks
- Reels
- Tank Linings
- Yarn Dryers

TRANSPORTATION:
- Decorative Paneling
- Dining Car Kitchen Equipment
- Stream Lined Car Exteriors
- Stream Lined Locomotives
- Sugar Car Linings
- Tank Cars

terior of the tank, the exterior can be enameled satisfactorily.

Electrical contacts are usually made from copper because of this metal's excellent electrical conductivity; however, because copper oxidizes in certain environments, an alternate metal is often required. Silver, whose conductivity is superior to copper's, is an excellent substitute; however, its cost is usually too high to warrant wide commercial use. By using silver-clad steel, the luxury metal is made available for general use.

Clad steels can be worked hot or cold by almost all commercial fabrication processes with but a few minor changes in work methods. They are available in a wide variety of flat shapes ranging in thickness from 3/16 of an inch to 3 inches, in width from 48 inches to almost 15 feet, or in length up to 40 feet.

In many cases the clad steel product is easier to work than the solid cladding material. Thus, by using the same press, dies, and other forming equipment, the stainless-clad steel can be formed more quickly and more easily than solid stainless steel.

The design and fabrication of clad steel tanks, pressure vessels and other equipment follows closely general practice for the design of similar steel structures. Fabrication follows routine procedure, maintaining continuity of corrosion resistant surface throughout.

It has been estimated that the clad steel product could replace solid stainless steel in about 50% of the known uses for solid stainless steel sheet, strip, and plate. The same holds true for many other metals.

Unquestionably, the use of clad steels has by no means reached the saturation point. All indications are that, as this relatively new engineering material is more widely known and appreciated, new applications for its use will be found.

The P. A. and the Auditor

Internal audit can help establish proper purchasing organization and procedure.

Basic principles of effective purchasing policy and administration.

Simple standards for checking efficiency of the purchasing operation.

By Graham W. Garton

General Purchasing Agent
The British American Oil Co., Ltd.
Toronto, Canada

●

Address delivered at a recent meeting of the Toronto Chapter of The Institute of Internal Auditors.

YOUR Purchasing Agent is probably a harassed, overworked and under-staffed ulcer sufferer, who is continually under fire these days from Top Management because of large inventories in some lines and scarcities in others, because the expenses of his department have gone up when the volume of buying is going down, and generally because he is on the expense end of the business at a time when profits are shrinking. Add to all this that he is expected to be able to get what is wanted where it is wanted when it is wanted for next to nothing, or better still, as a "no charge" sample; that in addition to being a buyer, he is expected to be something of an economist, an accountant, a personnel supervisor, a lawyer, a salesman, a public and industrial relations specialist, and to know somebody who can produce four seats on the fifty-yard line and a hotel room at a moment's notice—add all this, and I think you will agree that the poor fellow needs your sympathy and your help.

Of course, "the Lord helps those who help themselves", and here are some ways in which the Internal Auditor can help the P. A. to help himself. I don't claim that individually or collectively these suggestions will provide an over-night cure-all, and the list is far from being exhaustive. After all, the best surgical equipment in the world is useless if the surgeon doesn't know his business. Therefore I claim only that these suggestions, if studied by the right Purchasing Agent, might produce a more efficient Purchasing Department, thus lessening the burdens of Top Management and the Internal Auditor.

First, and most important, the company policy should be written out, and given to the Purchasing Agent, together with an organization chart which clearly indicates his line of responsibility. Too often the Purchasing Department has to take instructions from three or four operating departments, without an overall written Purchasing Policy to guide them. The written policy, published by an Executive Officer to all departments, lets all concerned know just what the Purchasing Department can or cannot do, and permits friendly, cooperative—but *impersonal* action. Personality clashes have threatened even the largest corporations at times, and here, I think, is the only sound way to avoid them.

Next, the duties, responsibilities and authority of the Purchasing Agent should be written out, and he should write out for his own staff, and for other departments, a manual of "Standard Procedure for Purchasing". This takes a lot of time and thought. However, even if it is only a mimeographed sheet, it is important that even the smallest Purchasing Department record its operating procedure.

Thirdly, I think it most important that the Department be required to submit periodic written reports to Top Management.

For years, it is true, University professors, prominent economists and the best men in the purchasing profession, have striven in vain to find a satisfactory yardstick for measuring Purchasing Department performance. Because of the many variable factors, it is usually given up as a seemingly impossible task, and as a result, the Purchasing Department continues to be looked upon as a necessary evil. However, it is surprising what information comes to light when regular reports are prepared covering such things as a comparison of Purchasing Department operating expenses with the departmental budget; number of invoices passed against purchase orders issued; dollar volume of purchases, and cost of purchasing $100.00 worth of material; market trends and a record of general commodity price indices; value of credits obtained through invoice checking and sales tax rebates; size of stores inventories, whether or not they are the direct responsibility of the Purchasing Department; and value of excess, obsolete and scrap materials sold or transferred.

Perhaps you think that the points outlined so far are very simple and elementary. In my experience, I would say that overlooking these basic facts accounts for over half the troubles besetting a Purchasing Agent today. Because of their simplicity, Top Management tends to overlook them, particularly in an organization which has expanded rapidly in recent years.

Before going on, I'd like to tell you briefly of the help that your Purchasing Agent can get from membership in the National Association of Purchasing Agents. The Association has a membership of over 11,500 Purchasing Agents in Canada, the United States, and Mexico. The literature and bulletins provided are invaluable to any member of the profession who can and will take the time to read them. The greatest advantage, however, is in the fellowship at the monthly meetings of the Local Association. Every one of the members can help your Purchasing Agent in some way, whether in trying to locate

scarce materials, or improving office routine, or in any of the other problems that beset the buyer.

The modern Purchasing Agent is a far cry from the tough hard-boiled buyer of a few years ago. Competition has forced Top Management to realize the tremendous opportunity for good public relations present in every aspect of the business, and particularly in purchasing, where the goal should be to spend the company's money with profit.

Advantages of Decentralization

If your P.A. is to be the Top Management Procurement Specialist he should be, he should consider the advantages of decentralization of the buying function if you operate more than one plant. This involves more work for the Internal Auditor, but with proper control of procedure, *written out*, decentralization can provide speedier service to operating departments without an increase in overhead, provided inventories are watched closely. The theory here is rather on the "Have your cake and eat it" order. There are obvious economies to be effected by centralized *control* of buying, but it does not necessarily follow that all buying must be done in one spot. If there is a written General Purchasing Policy, which enables the Purchasing Agent properly to control all purchases, then placing of national contracts should permit the buying of standard commodities from local warehouses by field offices using local purchase orders.

Commodity Basis

In the Head Office Purchasing Department, which then acts largely as a staff agency, the trend nowadays is to have buyers work on a commodity basis, and we have found this to be a great aid to efficiency.

One thing to guard against, particularly in a small Purchasing Department, is the tendency to load clerical work on to buyers. It doesn't make sense to have a high-priced commodity buying expert doing paper work which could be handled more economically (and very often more efficiently) by a competent clerk, any more than you would put a Chartered Accountant to work running an adding machine.

Another fault, I think, is the practice of forcing the Purchasing Department to do accounting work. At best, the Purchasing Agent and his staff, if they are doing the thing for which they were hired, are amateurs at accounting, and I believe the greater economy and efficiency is obtained by leaving accounting detail to the experts in the Accounting Department.

Perhaps you will be interested in an outline of our own operating and control procedure. Under our written General Purchasing Policy, authority to approve purchase requisitions can only be delegated in writing by the officer in charge of an operating or service department. Copies of these authorizations are sent to the Comptroller, Internal Auditor, and Accounting Department. All buying is done by the Purchasing Department on written requisitions only. Details of the order are entered on the requisition, which is then filed numerically. Our requisitions are printed in such a manner that information appears in the same sequence and position as it does on the purchase order, which cuts down typing time and reduces the liability of error. All details of the requisition are shown on the purchase order, including the name of the person who signed the requisition, and the accounting charge.

All Information with Invoice

A copy of the order goes to the Accounting Department, where the Report of Receipt of Goods is also maintained. Invoices are received in Purchasing, checked against the order, okayed for price and passed to Accounting for payment. The accounts payable copy of the order is attached to the invoice, with the report of receipts before payment, and that control prevents duplicate payment. When the Internal Auditor reviews the transaction, all information from start to finish is with the invoice.

At one time we used to drive the Accounts Payable boys crazy by putting through great stacks of invoices at peak periods, particularly at the end of the month. This was due to the fact that we filed orders by location, and processed invoices the same way. Now we file all orders alphabetically in a tub file, and process invoices alphabetically, on an assembly line basis. We put through approximately the same number of invoices every working day, and do it with less staff, and without overtime.

We think our system is pretty good, but the point is that what we have achieved was not done overnight, and that much of it could not have been done at all without the help, counsel, and good will of the Internal Auditing Department.

I started out by saying I would discuss ways in which you, the Internal Auditor, can help the Purchasing Agent to help himself. Many of the things I have touched on, are matters for Top Management decision. Today the P.A. is so busy trying to locate steel, pipe, nails, lumber, and hundreds of other commodities to keep the business running, that he probably doesn't have time to do the selling job on Top Management which is necessary for proper organization of his department. He needs the Auditor's help. I have found that an intelligent presentation of our problems to the Internal Auditor receives a sympathetic hearing; further, that a joint presentation from myself *and* the Internal Auditor very often receives more favorable consideration from the Comptroller and Top Management. In our own company, I have seen Internal Auditing grow from a minor, new-fangled checking function, to one of the most important service departments in the company.

Nowadays, Top Management looks upon its Internal Auditors as organization and control specialists, and that your influence has broadened accordingly. In working for any corporation, I think all of us have a right to be happy in earning an honest living. By getting to know your own Purchasing Agent and his problems better, I'm sure you can both be happier. Certainly, in my own experience you can provide an independent check of all phases of Purchasing Department functions which is of very real help in determining the effectiveness of the department, and that counts when our operating reports go to Top Management.

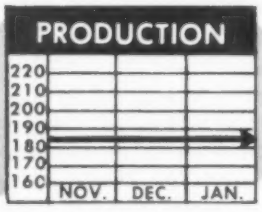
Adopt Methods Discussed

From your standpoint, I think that by adopting some of the methods I have discussed, you can do a better job of auditing the Purchasing Department's operations. The thought uppermost in the minds of Internal Auditors I have talked to in the last few years seems to be: "How can I be sure, in auditing the Purchasing Department, that the company's money is being spent wisely, and that we are receiving full value for our money?" As a

(*Please turn to page* 350)

Since the presentation of this address, the author has been promoted to the position of District Manager of the British American Oil Company, Ltd., with headquarters at Regina.

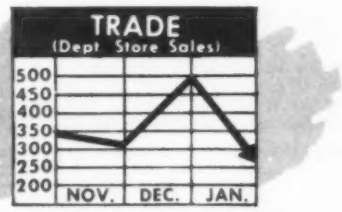
Where We Stand



Today's Business Trends As Reported In Current Statistics

	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN MONTH	% OF CHANGE IN YEAR
Industrial Production Index	1935-39=100	194	194	192	—	+ 1.0
Steel Production (Weekly)	000 net tons	1,831	1,803	1,723	+ 1.0	+ 6.3
Electric Power Production	mil KWH	5,692	5,646	5,278	+ 0.8	+ 7.8
Bituminous Coal Production	000 net tons	11,480	11,350	13,800	+ 1.1	—16.8
Auto, Truck & Bus Output	units	95,507	118,974	107,240	—19.1	—10.9
Petroleum Output	000 bbls	5,454	5,615	5,313	— 2.8	+ 2.7
Engineering Construction	000 $	127,101	162,516	71,733	—21.7	+77.2

All Commodities (Bur. Labor Statistics)	1926=100	160.5	163.7	166.8	— 1.9	— 3.8
Farm Products	1926=100	174.3	175.5	203.3	— 0.6	—14.3
Metal & Metal Products	1926=100	175.3	173.8	154.3	+ 0.8	+13.6
Building Materials	1926=100	200.9	203.2	194.2	— 1.1	+ 3.5
Steel Billets, Pittsburgh	gross ton	$58.24	$58.24	45.00	—	+29.4
Steel Scrap, heavy melting, Pitts.	ton	40.75	42.75	40.50	— 4.6	+ 0.6
Copper (Electrolytic)	lb.	.23 ½	.23 ½	.21 ½	—	+ 9.3
Cotton, mid., 15/16"	lb.	.3325	.3295	.3620	+ 0.9	— 8.1
Rubber, (Rib-smoked sheets)	lb.	.19 ⅛	.19	.21 ⅛	+ 0.6	—10.4
Wheat (No. 2)	bu.	2.54	2.54 ½	3.22 ⅞	— 0.2	—21.3



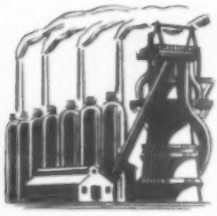
Dept. Store Sales Index (Fed. Res)	1935-39=100	274	485	251	—43.5	+ 9.1
Commercial Failures (Dun & Bradstreet)	no.	128	126	87	+ 1.5	+47.1
Freight Carloadings	cars	721,507	804,183	830,810	—10.2	—13.2

FINANCE

Stock Prices (Standard & Poor's)	1926=100	122.3	120.5	118.7	+ 1.4	+ 3.0
Bank Clearings (New York) —	mil $	6,812	7,066	7,622	— 3.6	—10.6
Federal Reserve Credit	mil $	23,193	23,727	22,568	— 2.2	+ 2.7
Currency In Circulation	mil $	27,919	28,415	28,374	— 1.7	— 1.5

Materials & Markets

STEEL



The break in steel scrap prices, averaging around $2 a ton, that occurred in the first part of the month, is being cautiously interpreted in the industry, despite the tradition that lower scrap prices are indicative of a declining demand. The consensus is that no general collapse in scrap prices, or falling off of demand for steel can be expected at least for the next six months. It is felt, rather, that a more normal market is slowly being approached, with the extreme pressure for various types of steel now off, and gray market activities and conversion deals declining. There is still plenty of demand for steel, however, and plates and pipe, for example, are expected to be as difficult to obtain in 1949 as they were last year.

Production continues at a record pace, with the latest weekly figures equivalent to an annual output of approximately 96,200,000 tons of ingots and steel for castings, about 6,558,000 tons larger than the tonnage made in the record production year, 1944. Increased capacity, better raw materials supply and the development of better production techniques can be counted on to assist in keeping the figure at a high level.

NON-FERROUS METALS

Copper production in 1948 was 3 per cent below the 1947 total, according to a preliminary estimate by the Bureau of Mines, but industry stocks of refined copper in the United States increased in December for the third successive month. Trade sources appeared to differ in interpreting these figures, some feeling that a return to a normal market was indicated, with a reduction in price to be expected. Looming ominously in the picture, however, is the continued strike of railroad workers at the Utah copper mine of the Kennecott Copper Corporation, which is estimated to be causing a loss of over 20,000 tons of copper a month.

Strikes at two of the leading zinc producing plants of the American Zinc, Lead & Smelting Co., continue to hamper any movement toward a better supply of that metal. Demand is still at a high level, government stockpiling is being pushed, and the European recovery requirements will probably not lessen — all adding up to extreme shortage. Industry leaders have expressed the opinion, nevertheless, that production in 1949 can be brought up over that of 1948, which, in turn, surpassed the previous year's, in spite of numerous difficulties.

Lead supply began to show improvement at the end of the month, following the end of the dock strike.

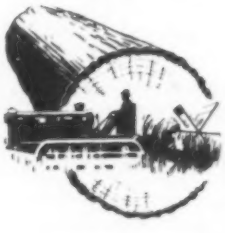
FUELS

Oil supplies are so good that the economy appeals made last year will not have to be repeated, according to the Secretary of the Interior. He warned, however, that new sources of liquid fuels will have to be found if this country does not want to find itself in a precarious position in the years to come. Meanwhile, further suggestions were being made that the Government provide funds to promote the development of a synthetic fuels industry, in spite of the present adequate supply.

The price picture on petroleum products was marked during the month by three reductions in heavy fuel oil prices, totaling approximately 70 cents a barrel. No major reductions in other oil products have been reported, but trade sources feel that any price cuts in such products as light fuel oil, kerosene and gasoline would cause a drop in crude oil prices. Opposite tendencies can be seen in the crude oil supply situation—Middle East production is high and imports to this country are increasing, while on the other hand Venezuela producers have sharply cut back production in the face of the present excellent world supply.

Bituminous coal output in this country in 1948 totaled 594 million net tons, according to a preliminary estimate of the Bureau of Mines. This is the third highest annual production in the industry's history, and was accomplished in spite of the work stoppage in March and April, the reduction in exports and a decline in consumption due to the unusual warm weather.

MISCELLANEOUS



Industrial alcohol prices dipped again by 2 to 3 cents a gallon toward the end of the month, although they had shown appearances of leveling off earlier. The total drop in prices since November is now close to 50 per cent . . . Two leading producers of synthetic methionine, an amino acid, have reduced prices by about 10 per cent . . . Supply of synthetic methanol is said to be coming into balance with demand this year, after six years of shortage, and trade sources expect the chemical to give ethyl alcohol a stiff fight for the antifreeze market. No downward trend in prices is expected.

The volume of unfilled orders for lumber by the end of 1948, according to the Department of Commerce, showed a "strong declining trend" and an increasing amount of newly produced lumber was piling up at the mills despite "generally declining prices." Lumber stocks reached their highest level since the war at the end of September, latest month for which the department had data.

The wartime pooling agreement among manufacturers in the synthetic rubber field will probably be terminated soon, according to John L. Collyer, president of B. F. Goodrich Company. He prophesied that the action would stimulate the incentive needed for discovery and production of better man-made rubbers.

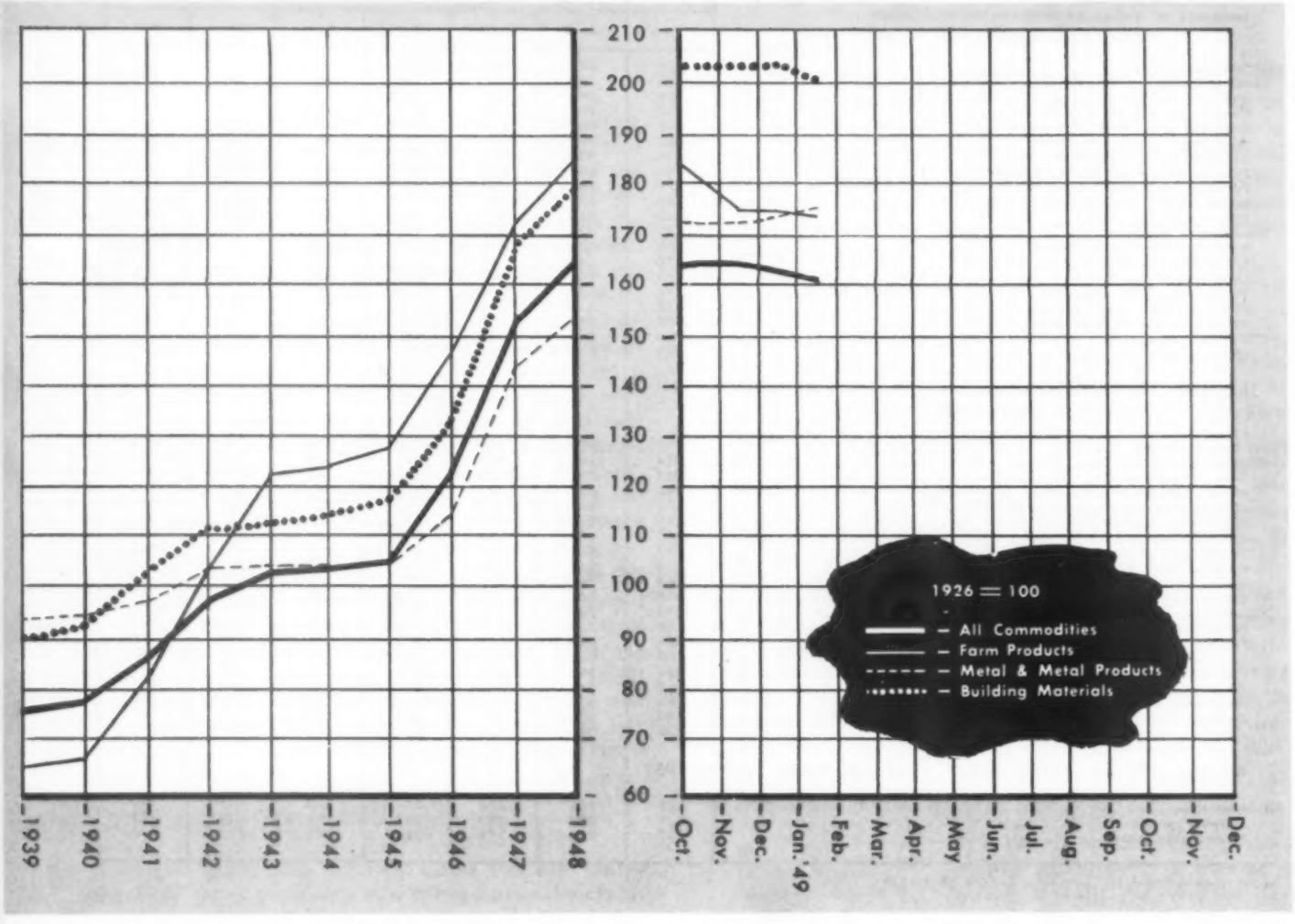
MANUFACTURERS' SALES, INVENTORIES AND NEW ORDERS

	1947	1948					
Indexes of Value of Manufacturers' Sales (Average Month 1939 = 100)	Nov.	June	July	Aug.	Sept.	Oct.	Nov.
Total Manufacturing	337	336	308	341	370	354	353
Durable Goods	353	369	333	368	404	398	400
Iron, steel & prod.	335	341	301	362	389	393	386
Nonferrous metals & prod.	442	422	350	421	487	456	489
Electrical machinery & equip.	444	452	410	414	505	472	496
Machinery, except electrical	325	381	317	347	381	359	354
Automobiles & equipment	401	433	438	437	474	503	510
Transportation equip. except autos	486	540	457	503	528	540	561
Furniture and finished lumber prods.	271	264	226	259	290	270	258
Stone, clay and glass products	250	273	267	289	298	302	288
Other durable goods	288	262	248	282	295	268	263
Nondurable goods	328	317	294	325	350	328	322
Food and kindred products	335	326	310	315	359	322	310
Textile-mill products (excl. apparel)	319	340	269	342	369	344	340
Leather and products	251	245	256	309	325	283	270
Paper and allied products	328	330	301	342	355	348	349
Chemicals and allied products	328	320	292	331	355	322	309
Petroleum and coal products	302	329	337	341	345	345	351
Rubber products	354	342	339	351	348	344	330
Other nondurable goods	352	316	254	341	361	344	349
Indexes of Book Value of Manufacturers' Inventories (Average Month 1939 = 100)							
Total Manufacturing	257	277	281	283	285	287	290
Durable Goods	274	288	290	291	296	297	302
Iron, steel & prods.	203	218	226	227	232	236	241
Nonferrous metals & prods.	249	263	271	276	283	287	283
Electrical machinery and equipment	373	397	398	396	402	401	402
Machinery, except electrical	282	299	298	298	302	303	306
Automobiles and equipment	449	476	475	476	490	482	489
Transportation equip., except autos	621	625	635	629	634	639	665
Furniture and fin. lumber products	216	260	259	261	252	247	253
Stone, clay and glass products	168	159	159	166	174	174	179
Other durable goods	213	189	183	184	189	192	194
Nondurable goods	243	268	274	276	277	279	281
Food and kindred products	244	227	237	240	229	238	251
Textile-mill products (excl. apparel)	226	256	261	262	257	256	254
Leather and products	209	262	264	258	245	244	254
Paper and allied products	265	292	305	311	315	317	314
Chemicals and allied products	259	284	284	282	278	280	286
Petroleum and coal products	176	200	207	214	224	226	232
Rubber products	242	295	289	287	288	284	288
Other nondurable goods	290	375	405	407	418	405	392
Indexes of Value of New Orders (Average Month 1939 = 100)							
All industries	268	265	246	251	272	249	250
Durable goods	307	307	291	287	309	278	277
Nondurable goods	244	240	219	230	249	231	234

Source — Department of Commerce, Revised Series

SALES, INVENTORIES AND INDUSTRIAL PRODUCTION

The Price Picture



Straws in the Trade Wind

Reynolds Metals Co. and Aluminum Company of Canada are seeking power sites in British Columbia with the intention of constructing aluminum plants in the area. Reynolds is reported to be interested in development of roughly 1,000,000 horsepower to turn out a billion pounds of aluminum a year . . . Senator Owen Brewster has revealed that plans are being studied for developing vast manganese deposits in Maine, as well as the possibility of establishing a new steel industry there . . . ilmanite, a mixture of iron, oxygen and titanium, is available in a deposit at Allard Lake, Quebec, Can , in sufficient quantities to supply U. S. industries with high grade metal for years to come, according to officials of the Quebec Mines Department. Ore production is expected to begin early in 1950.

The National Petroleum Council has reported that the year-end capacity of the country was 6,349,000 barrels daily, a 14 per cent increase within 21 months. The council estimates that capacity will be increased an additional 3.5 per cent during 1949 . . . Petroleum reserves in this country will be supplemented during the next 20 years by additional sources of power and greater efficiency of fuel consumption, according to R. J. S. Pigott, chief engineer of the Gulf Research and Development Company.

Business inventories increased $800,000,000 during November to a new record high of $55,300,000,000, according to the Department of Commerce . . . The Agriculture Department has predicted that 1949 will be another year of big farm production.

Nuts, Bolts and Diplomats

● *By Grey Leslie*

Standardization is most effective when practised on an international scale.

Considerations of military equipment bring this matter into the field of diplomacy.

Unification of British and American standards for screw threads is a promising start.

THE familiar Anglo-American slogan, "Hands Across the Sea" is about to be given a further practical application. Mechanical and industrial specifications are to be confirmed in an Anglo-American treaty on measurement standardization.

The first step is an international agreement on standardization of screw threads so that a British nut will fit an American bolt, or vice versa. This "Declaration of Accord" was signed with appropriate ceremony at the National Bureau of Standards in November. The Diplomats of the United States, Great Britain and Canada, under the urgings of their respective Military Strategists, have long been discussing mutual agreements between these countries toward this initial move.

It may appear strange that prosaic things like nuts and bolts are of such vital concern to the diplomats of these nations but it is not entirely a new role for them. To the average citizen screw thread standards may not seem to be a matter of great moment. But to the purchasing agent, manufacturer and trader it is of high importance, while to the diplomat and military strategist it is of profound significance.

Industrial standardization between the United States, Canada and Great Britain has been discussed and debated and eagerly sought for several decades. In the past, standardization of industrial machinery and its components has been purely national and singular. The early steps in England were taken by Samuel Bentham for the British Admiralty. In his eighteenth century day each full rigged ship required about 1500 pulley blocks. This posed a purchasing as well as an engineering problem, for the Admiralty purchased over 100,000 annually. Bentham introduced wood working machines to perform specific functions in a series of operations, with the result that pulley blocks were completely interchangeable and could be used on any British Navy ship.

In our own country, Eli Whitney introduced the principle of standardization and interchangeability in the production of muskets. History usually concerns itself largely with politicians or military personalities, but it would be challenging to find any statesman or military figure of his day who has had a more lasting influence upon our modern life than this Yankee inventor. When Whitney grew disgusted with the endless

Charles Sawyer, U. S. Secretary of Commerce, addressed the American-British-Canadian Joint Session on unification of screw threads on November 18, 1948, indicating the significance of this step in international commerce. At right are Dr. E. U. Condon of the National Bureau of Standards and Hon. Hume Wrong, Ambassador of Canada.

litigation engendered by the invention of his famous cotton-gin, he turned his inventive genius to the manufacture of fire-arms. Up to that time a musket, like most other things, had been made by one man who fashioned it from start to finish. Whitney, owing to a scarcity of skilled mechanics for large scale production, conceived the idea of having each man make one part only and having all parts interchangeable. It took him two years to perfect his method and train the mechanics, but once done, the way was open to mass production at low cost. The news of his exploit spread over the world, but the European countries long continued their old individual craftsman methods. Much of the machine tool industry in America and elsewhere grew out of Whitney's brilliant success.

In our own generation, Henry Ford evolved the idea of the production assembly line with standardized parts by applying the methods of cattle slaughter and meat packing to automobile production.

To-day because of standardization of equipment and product, the United States turns out annually untold millions of identical electric light bulbs, bath-tubs, telephones, nails, and fountain-pens. But the first and effective impetus came from military tacticians and strategists.

Effects of Standardization

Without standardization, mass production is impossible, and without the mass production of more than ten thousand items, armies and navies and air forces would be badly crippled. With standardization goes interchangeability of machine elements, parts and products.

International standardization is a natural consequence of total war when it is waged by groups of powers. Because screw threads were not standardized, to mention one item, it was seldom possible to interchange machine parts or to make the same weapons on both sides of the ocean. Many precious months were wasted here in supplying our Allies with industrial and military equipment that met their specifications.

The first Unified Screw Thread Standard was formulated in five major and several informal conferences of representatives of the countries concerned. In July 1918, the Congress of the United States authorized the appointment of the National Screw Thread Commission, with the Director of the National Bureau of Standards as Chairman, to investigate and promulgate standards for screw threads. One year later, and after a thorough study of screw thread practice in this country, the Commission conferred with British and French engineers and manufacturers of screw thread products, for the purpose of discussing the tentative report which it had prepared with the hope that it might serve as a basis for international standardization.

Dr. Condon signs the Declaration of Accord on behalf of the United States. The document was also signed by T. R. B. Sanders of the Ministry of Supply of Great Britain; C. D. Howe, Canadian Minister of Trade; Sir Ewart Smith, for British industry; James G. Morrow, Canadian Standards Association.

No definite agreements were reached, but the need for continued study was recognized.

In 1926, a further attempt was made to unify the British Standard Whitworth Thread, having an angle of 55° and the American National Thread, having an angle of 60°, when a British mission visited the United States and proposed a basic thread angle of 57½°. The compromise was not considered acceptable.

In 1943, a British mission again visited the United States, at the invitation of the Combined Production and Resources Board, and Canadian representatives were also invited to participate in the discussions, in which notable progress was made on projects of immediate concern. In August-September of 1944, a joint United States-Canadian group, sent to London by the same Board, conferred with committees of the British Standards Institution.

In September-October of 1945, under the auspices of the same Board, a conference on Unification of Engineering Standards was held in Ottawa, Canada. At this conference a unified form of thread having a 60° angle, together with standard sizes and pitches, was agreed upon. Thus the foundation was laid for the standards to be agreed on, but a vast amount of work remained to be done in developing and agreeing upon classes or grades of fit and corresponding tolerances and allowances.

When a small British delegation visited the United States in July, 1948, basic mathematical formulas for such tolerances and allowances were tentatively agreed upon and later ratified by correspondence, thus making possible the completion of the standards.

Thus a new and expanded industrial era will be opened to the industrial producers of both continents.

It is unlikely that the proposed arrangement with Great Britain will stop at screw threads. Standardization will go much farther in industry than in the Army, Navy and Air Forces, partly because of the flexibility of industrial thought, partly because of the time lag in the development, testing and adoption of new weapons, and partly because it requires some years to abandon an obsolescent weapon which is already in the hands of several million trained men.

Nevertheless the proposed arrangement indicates that engineering specifications will be increasingly internationalized and that an internationalized industry will be closely interwoven with armies that are themselves internationalized in the sense that their weapons will be more or less identical.

There is a highly important significance for industry here. Exporters will find it easier to do business with foreign customers, when standard machines and products can be taken off the shelves and sent over-seas.

With the development of count-

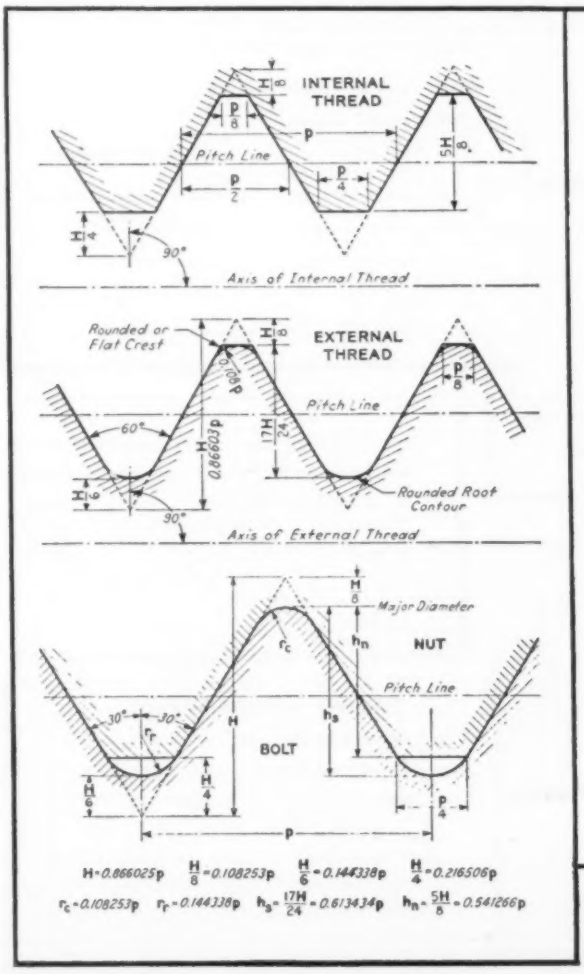
Dr. Louis Tuckerman, Assistant Chief of the Mechanics Division, National Bureau of Standards, examines threaded part fractured in a fatigue test. Such tests, simulating the vibrations of high-speed machinery, help to determine the most suitable thread form for particular applications, as in aircraft or ship design.

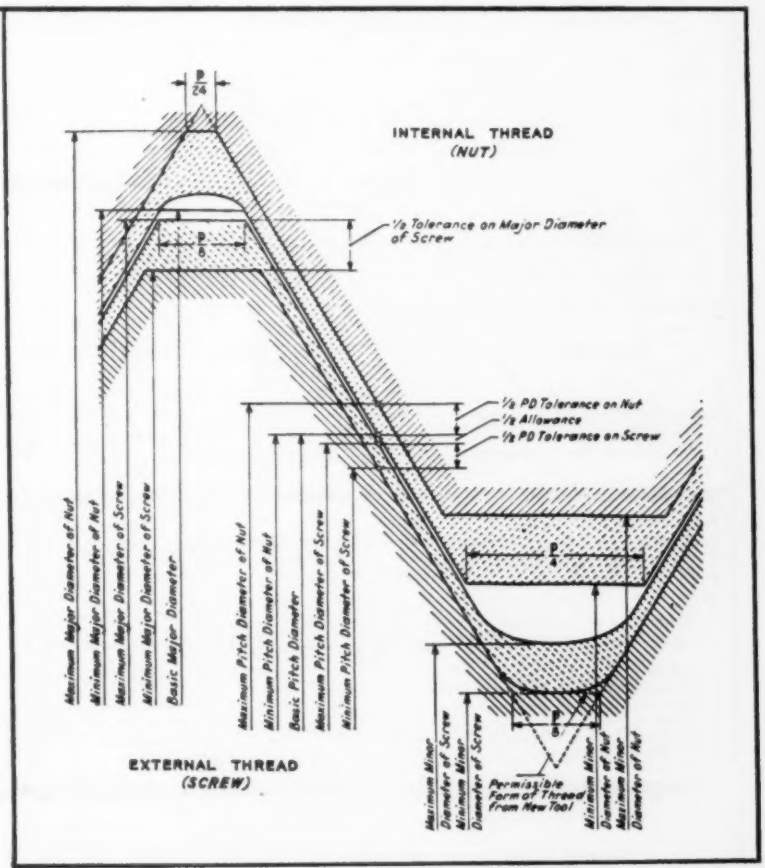
less new machines at home and abroad, there has been a corresponding multiplication of types and specifications. In addition to variation in sizes, sometimes measured in thousandths of an inch and variable degrees of turns, the new industrial requirements have necessitated development of new types of alloys to supply strength in nuts and bolts out of all proportion to sizes. The European tendency has long been for weight and bulk. The American goal has been strength and lightness. Lack of interchangeability has thus been a most serious problem.

The problem has ramifications that reach far into diplomacy and strategy as well as in the economic field. Besides the increasing use of American machinery for Europe's industrial rehabilitation, interchangeability of parts is a vital factor in the rearmament programs. Such matters as aircraft parts and machine tools for the production of all kinds of military goods are intimately involved.

The background of world crisis, in which the United States still must accept the responsibility as the "arsenal of democracy", conclusively supports the conviction that the international standardization of screw threads is but the first step on a long and expensive but imperative journey to the greater goals of international co-operation. The development has profound significance, not only technologically, but psychologically and politically.

Meanwhile, the international standardization of nuts and bolts may be a means of taking some of the squeaks and rattles out of the democratic nations' alliances for defense and help tighten the screws on brutal aggression.

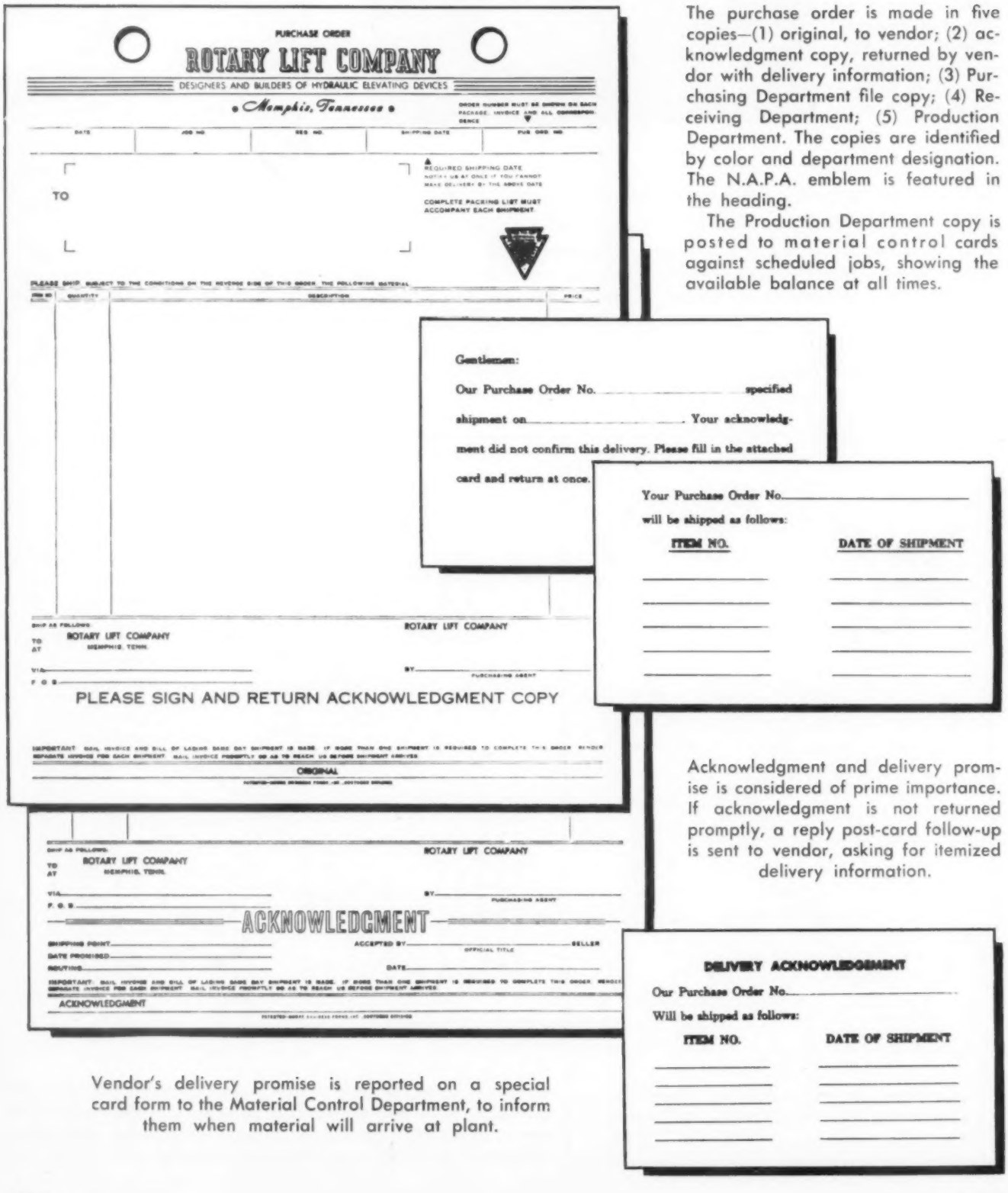



INTERNAL THREAD (NUT)
½ Tolerance on Major Diameter of Screw
½ PD Tolerance on Nut
½ Allowance
½ PD Tolerance on Screw
Maximum Major Diameter of Nut
Minimum Major Diameter of Nut
Maximum Major Diameter of Screw
Minimum Major Diameter of Screw
Basic Major Diameter
Maximum Pitch Diameter of Nut
Minimum Pitch Diameter of Nut
Basic Pitch Diameter
Maximum Pitch Diameter of Screw
Minimum Pitch Diameter of Screw
EXTERNAL THREAD (SCREW)
Permissible Form of Thread from New Tool
Maximum Minor Diameter of Screw
Minimum Minor Diameter of Screw
Minimum Minor Diameter of Nut
Maximum Minor Diameter of Nut

Unified screw thread standards provide for interchangeability of American and British threaded parts, with specified dimensions, tolerances, and clearances for three classes of fit.

Purchasing Procedure at the Rotary Lift Company

● **By W. E. Rier**
Purchasing Agent
Rotary Lift Company, Memphis, Tennessee



The purchase order is made in five copies—(1) original, to vendor; (2) acknowledgment copy, returned by vendor with delivery information; (3) Purchasing Department file copy; (4) Receiving Department; (5) Production Department. The copies are identified by color and department designation. The N.A.P.A. emblem is featured in the heading.

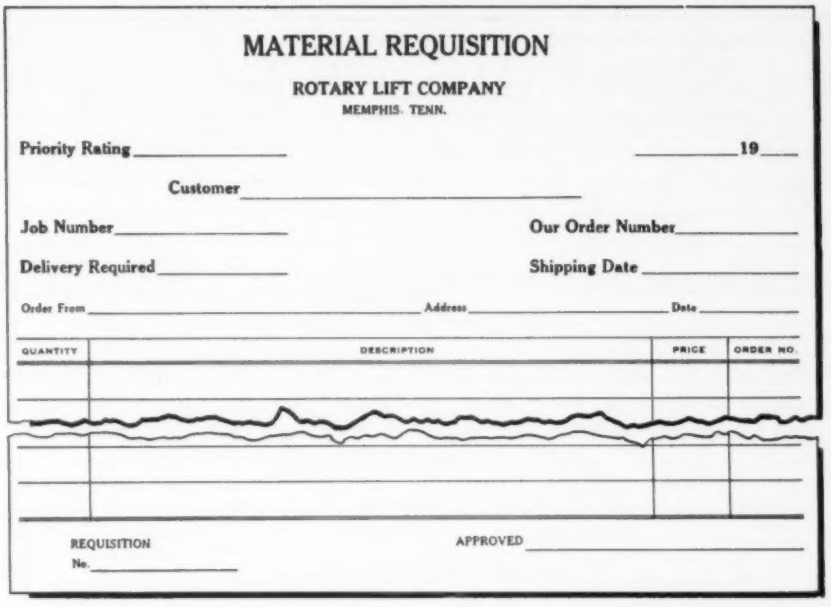
The Production Department copy is posted to material control cards against scheduled jobs, showing the available balance at all times.

Acknowledgment and delivery promise is considered of prime importance. If acknowledgment is not returned promptly, a reply post-card follow-up is sent to vendor, asking for itemized delivery information.

Vendor's delivery promise is reported on a special card form to the Material Control Department, to inform them when material will arrive at plant.

The material requisition form is used by shop and production departments to advise Purchasing of their requirements of maintenance and production materials. Purchase orders are issued to supply these needs.

If requirements change after an order has been placed, a "Change Order Notice" is issued. This form is similar to the purchase order and follows the same procedure as to acknowledgment and distribution of copies, and supersedes order copies in departmental files. The color code for change orders differs from the original, so that there is a visual signal in each department that the original order information has been superseded.



MATERIAL REQUISITION

ROTARY LIFT COMPANY
MEMPHIS. TENN.

Priority Rating _____ _____ 19___

Customer _____

Job Number _____ Our Order Number _____

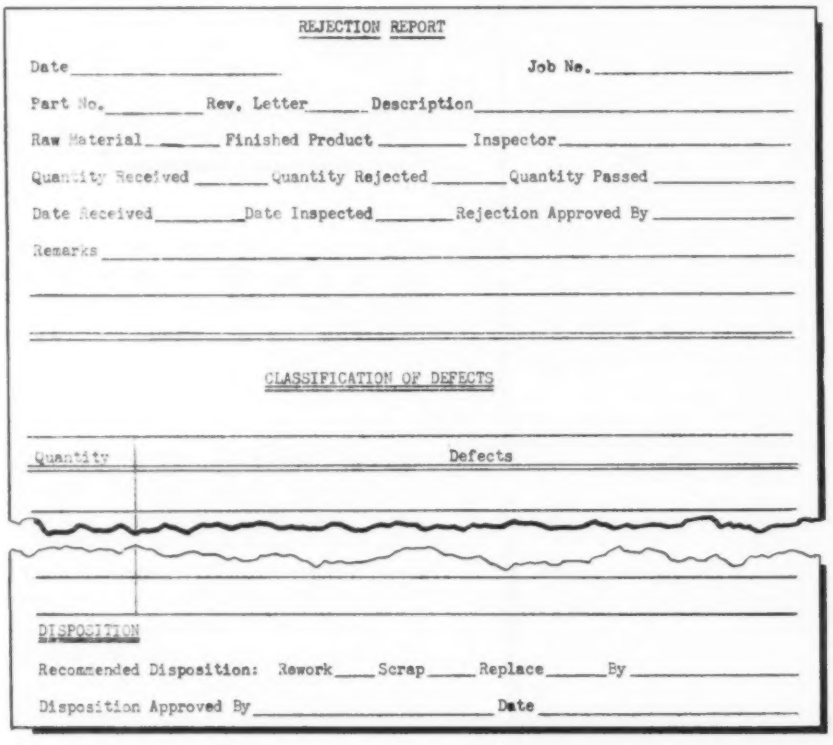
Delivery Required _____ Shipping Date _____

Order From _____ Address _____ Date _____

QUANTITY	DESCRIPTION	PRICE	ORDER NO.

REQUISITION No. _____

APPROVED _____



REJECTION REPORT

Date _____ Job No. _____

Part No. _____ Rev. Letter _____ Description _____

Raw Material _____ Finished Product _____ Inspector _____

Quantity Received _____ Quantity Rejected _____ Quantity Passed _____

Date Received _____ Date Inspected _____ Rejection Approved By _____

Remarks _____

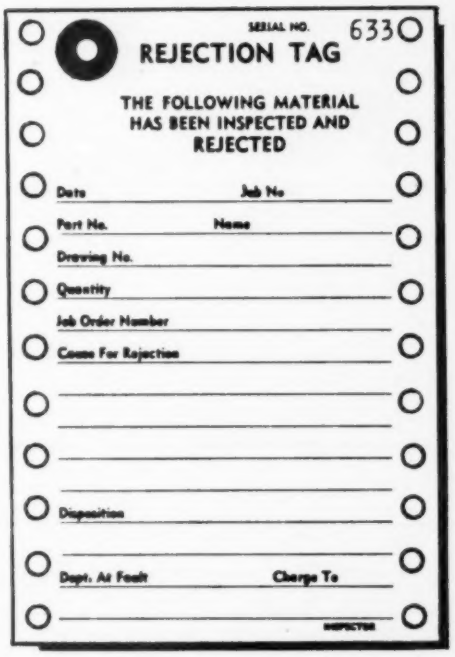
CLASSIFICATION OF DEFECTS

Quantity	Defects

DISPOSITION

Recommended Disposition: Rework ____ Scrap ____ Replace ____ By _____

Disposition Approved By _____ Date _____



SERIAL NO. 633

REJECTION TAG

THE FOLLOWING MATERIAL HAS BEEN INSPECTED AND REJECTED

Date _____ Job No. _____

Part No. _____ Name _____

Drawing No. _____

Quantity _____

Job Order Number _____

Cause For Rejection _____

Disposition _____

Dept. At Fault _____ Charge To _____

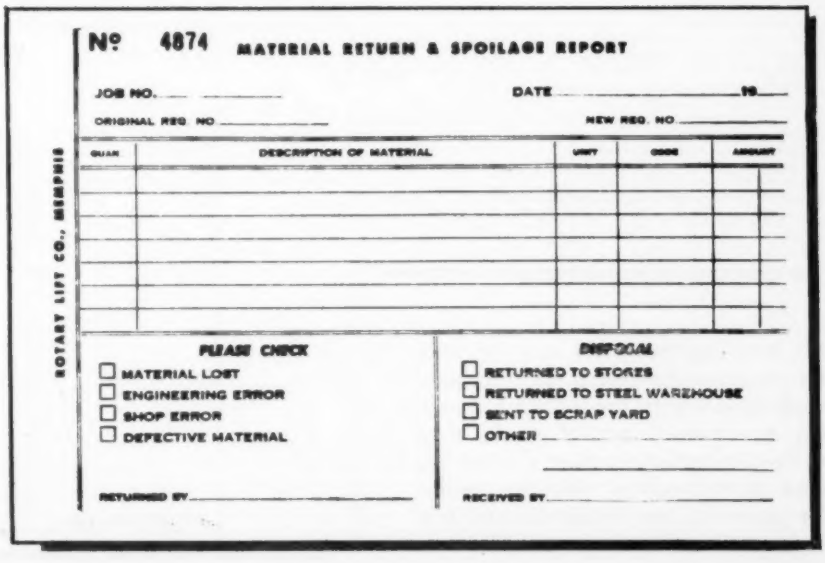
INSPECTOR

The mimeographed "Rejection Report"

Failure of delivered material to pass inspection is reported to Engineering on a mimeographed form filled out by the inspector. At the same time, a rejection tag is attached to material and copies are sent to the cost department, production control, and to the foreman.

Engineering determines whether the material can be adjusted at plant, or whether Purchasing should return it to vendor for replacement, or whether a claim should be filed with carrier.

All rejections and spoilage are reported to Purchasing, Accounting, and Material Control, to keep the records accurate.



No. 4874 MATERIAL RETURN & SPOILAGE REPORT

JOB NO. _____ DATE _____ 19___

ORIGINAL REQ. NO _____ NEW REQ. NO _____

QUAN.	DESCRIPTION OF MATERIAL	UNIT	CODE	AMOUNT

ROTARY LIFT CO., MEMPHIS

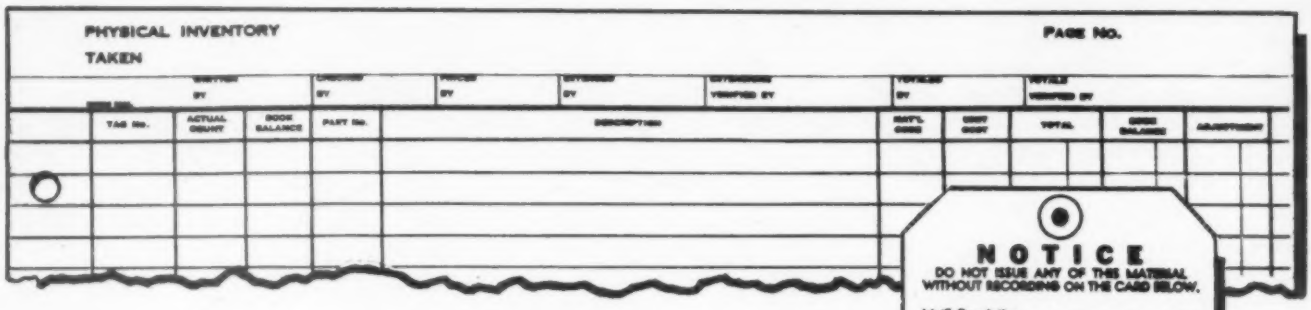
PLEASE CHECK

- ☐ MATERIAL LOST
- ☐ ENGINEERING ERROR
- ☐ SHOP ERROR
- ☐ DEFECTIVE MATERIAL

DISPOSAL

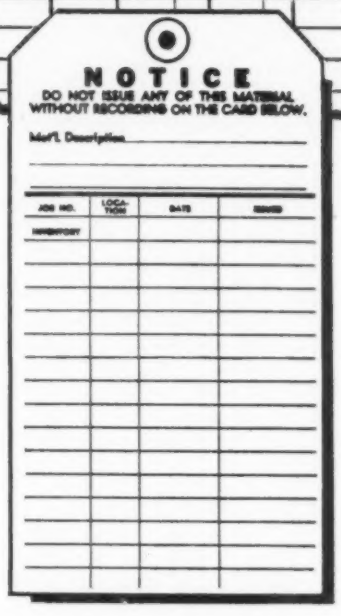
- ☐ RETURNED TO STORES
- ☐ RETURNED TO STEEL WAREHOUSE
- ☐ SENT TO SCRAP YARD
- ☐ OTHER _____

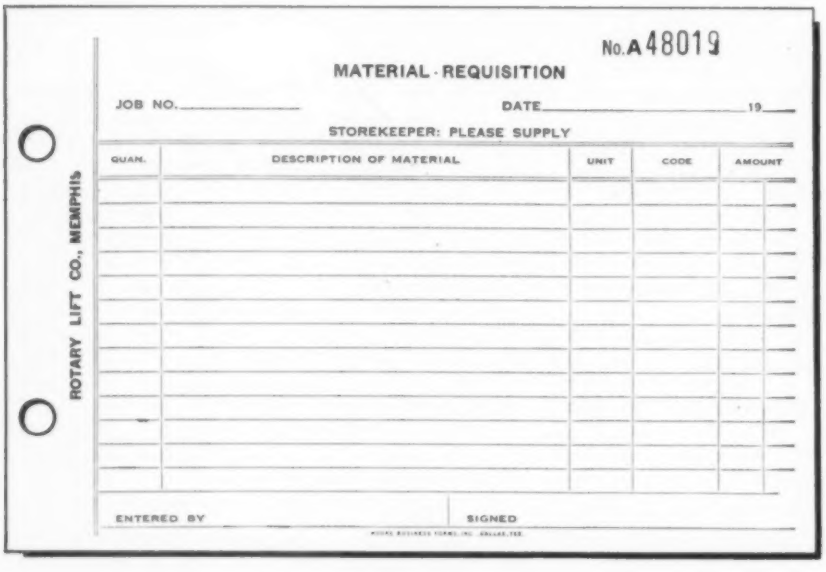
RETURNED BY _____ RECEIVED BY _____


PHYSICAL INVENTORY
TAKEN
PAGE NO.
TAG No. | ACTUAL COUNT | BOOK BALANCE | PART No. | DESCRIPTION | MAT'L COST | UNIT COST | TOTAL | BOOK BALANCE | ADJUSTMENT

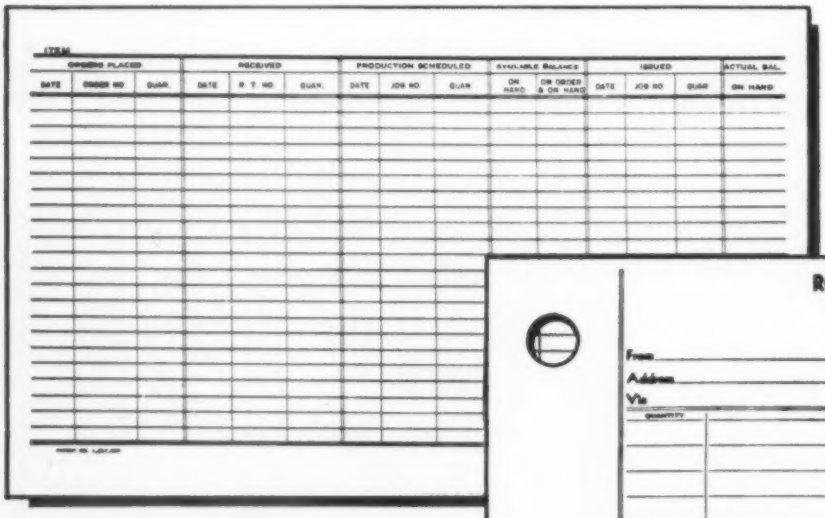
Periodically a physical count is made of all stock on hand, itemized and priced.

The Stores Department maintains a perpetual stock inventory on bin tags kept with the material.

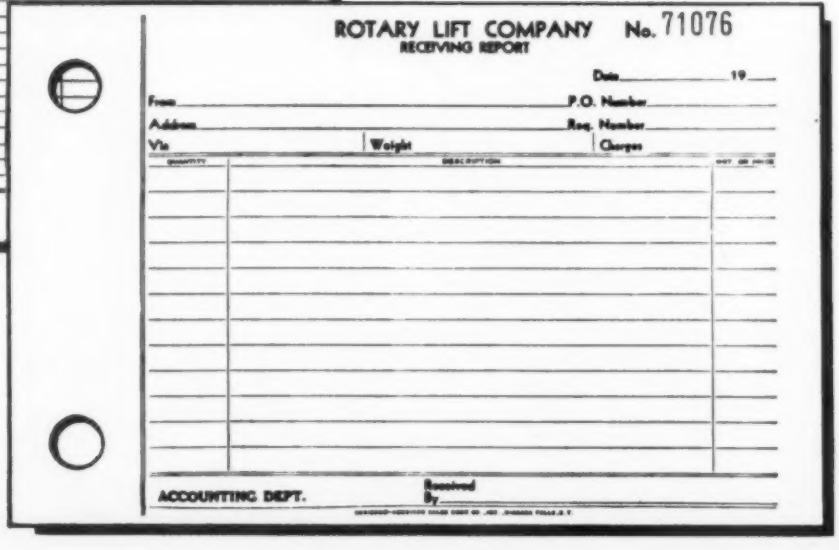

NOTICE
DO NOT ISSUE ANY OF THIS MATERIAL WITHOUT RECORDING ON THE CARD BELOW.
Mat'l. Description
JOB NO. | LOCATION | DATE | ISSUED
INVENTORY


No. A 48019
MATERIAL - REQUISITION
JOB NO. _____ DATE _____ 19__
STOREKEEPER: PLEASE SUPPLY
QUAN. | DESCRIPTION OF MATERIAL | UNIT | CODE | AMOUNT
ROTARY LIFT CO., MEMPHIS
ENTERED BY _____ SIGNED _____

Withdrawals from stock are made by use of a material requisition from shop departments to storekeeper.


ITEM
ORDERS PLACED: DATE | ORDER NO | QUAN.
RECEIVED: DATE | R. T. NO. | QUAN.
PRODUCTION SCHEDULED: DATE | JOB NO | QUAN
AVAILABLE BALANCE: ON HAND | ON ORDER & ON HAND
ISSUED: DATE | JOB NO | QUAN
ACTUAL BAL. ON HAND

Material control records are kept in a visible card ledger, showing orders placed, receipts, issues, production requirements, available and actual balance of materials. This system is used for production materials only, and not for maintenance materials. This record is the basis for issuing requisitions and setting reorder points.


ROTARY LIFT COMPANY No. 71076
RECEIVING REPORT
Date _____ 19__
From _____ P.O. Number _____
Address _____ Req. Number _____
Via _____ Weight _____ Charges _____
QUANTITY | DESCRIPTION | UNIT OR PRICE
ACCOUNTING DEPT. Received By _____

All incoming materials are reported on a receiving ticket. The original copy goes first to Production for posting to material control cards, then to Purchasing for checking the invoice, then to Accounting with the invoice for payment. Two duplicates are filed until order is completed.

The Way to Inter-American Trade

Trade potential is great, but opportunities depend on two-way cooperation.

Can free enterprise learn to get along with government-dominated economies?

Foreign investors are wary of expropriation of their Latin American assets.

●

By H. H. Slawson

BUSINESS men of the United States do not consider trade with Latin America as a one-way street. This was the assurance brought by John J. McCaffrey, President of International Harvester Company, to the delegates of twenty-two Latin American states who participated in the fourth plenary meeting of the Inter-American Council of Commerce and Production, held recently in Chicago.

"We know," said Mr. McCaffrey, "that he who sells must also buy if he expects to be paid. Latin America is already sending to the United States a large volume of goods. That trade can and, I believe, will be increased as you increase your industrialization, develop and use your natural resources, and have a greater variety of goods to sell to us.

"To you and all our business friends in Latin America I recommend that, if you want to sell more goods in the United States, you choose your customers, select your goods, and then visit us and ask us to buy. We are business men, too. We always have time to see a visitor's goods and listen to his story. You will be welcome, however often you come."

Assembled with the visitors from the southern countries were representatives of some 130 chambers of commerce and numerous national trade organizations interested in closer trade relations with our neighbor states of the Western Hemisphere. Organized in 1941, the Council acts as a Chamber of Commerce for business men of the Americas. Subject matter of their Chicago discussions dealt largely with the financial phases of inter-American trade.

Summed up, the four-day conference made considerable progress in forging what Congressman Joseph W. Martin, Jr., former Speaker of the House of Representatives, called "the great secret weapon of the Americas". Addressing the assembly's closing session on "The Servant of Peace", Congressman Martin described this weapon as "mutual trust, mutual confidence, and good will."

"The conference," he declared, "represents, to my mind, one of the Western Hemisphere's highest expressions of constructive cooperation for peace and progress. The practical measures which advance human welfare are seldom the invention or inspiration of government. It is rather the men who keep production and commerce flowing who are the real authors of all material progress, and the peace of the world can flower only under conditions of economic abundance."

Throughout the sessions, repeated reference was made to the importance of free enterprise for developing a nation's economic life and to the dangers inherent in any program which places reliance on government to get the world's business operations moving again. Some sharply contrasting points of view were brought out.

"The principal difficulty in government programs," said Congressman Martin, in touching on this subject, "is that they too often start out on an overly ambitious scale. Business men approach their problem in a more practical way. They patch up bad holes in the road and get traffic moving. Government programs too often abandon the old road, and the people are left with no thoroughfare whatever while the new one is being debated and designed.

"Freedom of enterprise has been attacked on the ground that it is extravagant with natural resources and human energy. Yet the verdict of history is that human progress marches step by step with the perfection of the instruments of freedom and self discipline. . . . I have studied the temper and spirit of the Americas for many years and I am convinced that an overwhelming majority of the peoples of this hemisphere are aligned on the side of confidence and trust in the institutions and inspirations of freedom. The disciplines of peace are not glamorous. They do not feed upon martial music. Yet they must be developed by patience and determination if the world is to move on."

No Single Yardstick

From Dr. Alberto Llaras Camargo, Secretary-General of the Organization of American States, Washington, D. C., came the assertion that, in arguing for substitution of private for government enterprise in industry, there is danger in applying to the Latin American problem the same yardstick used to measure the current economic capacity of the United States.

The United States, he said, has become great chiefly as the result of the investment of private promotion capital. Many North Americans, he said, want to know why Latin America could not travel this same road.

"Such a possibility," he declared, "is out of question for Latin America and, I am afraid, for any part of the world today." Citing an example, he referred to a decree recently passed by one Latin American country requiring that management in factories and agricultural enterprises furnish their workers, under certain conditions, with shoes.

"No doubt," he continued, "many here would consider that a socialistic act, an unwarranted intervention by the state, an invasion of the privacy of the individual. The choice of whether to go shod or barefoot is held to be one of the inherent rights of the individual.

"Well, in some Latin American

states this is a problem of vital concern to the state. Millions of barefoot human beings fall prey to tropical diseases that are contracted through the soles of their feet, with the result that the population's capacity for work declines, while there is an automatic increase in the cost of the state's public health program, free hospitalization, drugs and medical care for the people.

"But, if there are not enough shoe factories to meet the sudden increased demand for shoes, the state has to manufacture them also. Any delay until the economic situation improves would entail shocking prolongation of endemic conditions that are undermining the health of populations, that create very serious social problems and that are both inhumane and uneconomic.

A Vicious Circle

"Some way must be found to break the vicious circle in Latin America that prevents the increase of production because there are not enough consumers with purchasing power, and at the same time prevents the raising of standards of living of those consumers, for lack of abundant, economical production.

"The governments have attempted in various ways to break this circle, for they all realize that they must accomplish this in order to give free rein to progress. But all such attempts require resources, especially in the form of credit, and they also involve a measure of state intervention that would be considered extreme or even excessive in the United States."

Latin America is not a waste land, Dr. Camargo insisted. Its 147 million inhabitants, spread out over all the most habitable regions, have established industries, business enterprises and public works "on a modest scale" but still on a sound and permanent basis with safeguards provided by local laws and government authorities.

"It is just as complicated a matter," he remarked, "to set up in business in Latin America today as in Texas or Oklahoma, because there are regulations, taxes, labor unions and anti-trust laws everywhere—all the machinery, in short, that the state created to keep pace with the tremendous expansion of power resulting from the industrial revolution and modern capitalism, in order to check that power and prevent its abuse."

While government leaders in Latin America might consider it desirable to do away with all state interference in economic matters, in order to attract foreign capital and promote a more rapid development of their countries, this, he said, would be no longer possible, "or at least only to the same extent that it could be accomplished in the United States."

Socialism by Necessity

"In view of the large number of industries and projects that are government-controlled in Latin America," continued Dr. Camargo, "North American capitalists tend to classify political systems south of the Rio Grande as predominantly socialistic or collectivistic. They complain that the state in those countries is all-absorbing and leaves no room for individual initiative. That is not true if it is looked upon as a *tendency*; but it is often true if we consider individual cases."

In Latin American countries, he went on, the state has been compelled to assume burdens and responsibilities that it escapes in other parts of the world, not because of any leaning toward socialism, but owing to the necessity of taking the place of capitalists and promoters who are lacking.

"Moreover," he said, "the state embarks on this course under popular pressure, not from the left, but chiefly from the conservative elements of the country. When a town lacks electric power, the salient fact is that, in the absence of private capital for the project, everyone demands that the state provide a service too urgently needed to be postponed.

"And another thing should be borne in mind. It was private capital itself, chiefly originating in North America, that, before the 1929 crisis, provided Latin American states with funds for national progress. Then came the depression and later the second world war, which stopped all credit that was not guaranteed by official North American agencies.

"The war and the favorable credit policies of the Export-Import Bank served to maintain normal growth and development for a while. After the war, however, official credit was shut off, just as private credit had been. And in Latin America today we are experiencing a crisis that is the direct result of this latest development.

"There is little doubt that private North American capital would find excellent opportunities for investment in Latin America. . . There are more opportunities and greater security for private capital today in Latin America than in any other part of the world.

"But foreign investments are not sufficient to promote the development of Latin American nations. The lack of economic progress in many of them cannot be cured without continuous government pump-priming, that is, the intervention of the state in development of certain facilities that are in the public interest and cannot be financed by private capital, either domestic or foreign.

"Latin America needs urgently transportation facilities, highways, railroads, vehicles, cheap and abundant electric power, mechanization of its agriculture and better production methods; and it also needs, with all the benefits that will accrue from these improvements, a systematic campaign in favor of the human element, to raise the standards of living of the people. This will be a very extensive project and will involve steps that would appear strange indeed to the North American mind.

"What Latin American countries are calling for is not the underwriting of our progress by United States taxpayers, without any benefit to the latter. For this reason we do not refer to a Marshall Plan for our countries; we speak rather of credit and development corporations or inter-American banks, or of credit plans for the Latin American governments, always on a basis of reciprocal benefits, and as a sound and advantageous long-term arrangement for the United States."

Foreign Investments Discouraged

Discussing "Foreign Investments," Curtis E. Calder, Chairman of the Board of Electric Bond and Share Company, indulged in some caustic comment on the matter of expropriation.

"To a thoughtful citizen of a nation whose resources are inadequately developed," said Mr. Calder, "foreign investments might mean economic salvation. . . But it seems the height of absurdity for nations which need and seek the aid of foreign capital to say to the foreign investor:

"'We need your capital to assist us to develop our resources, promote our industrialization, increase our productivity. Come to us with your skills, your enterprise, and your money. Bring light to our cities, roads to our hinterlands, and the hope of a better way of life to many who have not known the comforts

of modern living. Of course you must respect our sovereignty. We know you understand that, but we must also inform you that after the mines are producing, the wells pumping oil, the factories constructed, the turbines turning, we shall feel free to seize your enterprises in whole or in part, compensate you in pesos or dollars and allow you to take the compensation home or not, dictated by our foreign exchange policy of the moment. Furthermore, we may set up government-owned enterprises to compete with you. They will be tax-free and their capital will be interest-free and we need not concern ourselves as to their efficiency and economy, as their expenses will be met from the public purse. . . Perhaps our past record has not been good, but be reasonable and cooperative and trust us and you will not regret it.'"

Efforts to remove such obstacles as these to the free use of foreign capital, as attempted in various international conferences, were reviewed by Mr. Calder, but, he declared, "results have not been too impressive."

Drafters of the International Trade Organization charter at Havana made an effort to write an acceptable article on "International Investment For Economic Development," Mr. Calder said. This controversial Article 12 had been begun at the earlier Geneva conference, he explained, as a simple statement of the value of foreign investments in promoting economic development and social progress, with an agreement by participating nations to provide the widest opportunities and the greatest security for such investments, consistent with the obligations of investors to refrain from interference in the internal affairs of the receiving countries.

"An agreement along these lines, faithfully respected," he continued, "would undoubtedly have been of great value. When it finally emerged from committee, however, this agreement was so modified as to provide full dispensation for governments who desired to continue to discriminate against existing investments or even to seize them for themselves or for their nationals. True, there is an obligation to provide 'just compensation' but this was nullified by defining 'just compensation' as payment in local currency with no obligation to allow its transfer abroad.

"This was certainly enough to turn any investor's hair grey, but unfortunately it is illustrative of the muddled thinking responsible for the distrust with which foreign investments are regarded. There is no deterrent to foreign investors as strong as the fear of expropriation when unaccompanied by prompt, adequate and effective compensation —which means compensation in a currency that is acceptable to the investor—but it proved impossible, both at Geneva and Havana, to obtain an outright commitment on this all-important matter. To be sure, the investment provisions of the Havana charter do away with some of the absurdities of the Geneva draft, including the definition of 'just compensation' and the exceptions to the rule of non-discrimination.

"What seems most significant to many investors is that the new Article 12, designed to reassure investors and revive the international movement of private capital, calls attention to the rights of sovereign states to take safeguards *against* foreign investments; to determine whether to accept or exclude them, and to prescribe requirements as to their ownership. In the absence of any requirements for the payment of prompt, adequate and effective compensation, this statement of the 'rights' of capital-importing nations is indeed disquieting."

"It is extremely important to persevere in our efforts to obtain wide acceptance of an International Code of Fair Practices relating to these foreign investments. The American nations are to be congratulated for the progress made at Bogota in writing such a code. But I regret that some nations, because of constitutional or other reasons, have felt it necessary to enter reservations on specific articles of the investment section of the Bogota agreement. It is particularly noteworthy that a provision was written into this section for prompt, adequate and effective compensation in cases of expropriation.

"I know that few nations deliberately create conditions which make it impossible for foreign enterprise to operate profitably. The few that do inevitably suffer the economic penalties of their misguided nationalism."

Speaking for the Argentine Chamber of Commerce, a member of that Chamber's board of directors, Sr. Rodolfo Tarantola, assured the Chicago conference that the Argentine Chamber, since its foundation, has consistently stood in favor of private enterprise, free trade, both in the domestic and international order, and the gradual strengthening and the successive integration of the economies of the different countries.

"Our Institution," said Sr. Massone, "has always advocated equal treatment for domestic and foreign capital, both necessary to strengthen and diversify the economies of young countries, to extend their natural resources and in that way to lay the foundations for the whole transformation of their raw materials. For this reason we think each country should set up an organic system of legislation to assure foreign investors of the right to bring in, keep and withdraw their capital, and of the right to dispose of the profits that may be obtained in the currency of their origin."

If Latin America is to play an important role in world economics, it will have to have more suitable exchange policies, E. M. Bernstein, director of research for the International Monetary Fund, asserted in an examination of the "Currency Exchange Situation in Latin America."

In a few fortunate countries exchange is provided freely to those who must make payments abroad, he stated, but in many Latin American countries the exchange situation is bad. Principal cause of trouble, he pointed out, is the inflation in those countries, adding that at International Monetary Fund headquarters it is not believed there is any easy way out of these exchange difficulties.

"In some Latin American countries," Mr. Bernstein continued, "exchange controls are suddenly imposed which act retroactively and make payments to foreign exporters and foreign business firms uncertain and haphazard. The effect on the Latin American business man who is scrupulously meeting his obligations, is to impair his credit abroad, not because of anything he has done, but because of his government's unpredictable policies.

"In my opinion, the foreign exchange policy of Latin America must become more orderly. This is an essential basis for expansion of trade and investment in Latin America. . . As business leaders of your communities, it is your job to see that domestic financial policy is consonant with a strong balance of payments, with financial stability and orderly exchange arrangement. That is the best way of assuring the well-being of your countries now and their progressive development in the future."

Don't overlook the salvage possibilities of belting after it has been retired from its original application.

Pointers on Purchasing Power Transmission

● By E. L. Cady

Shop habits of use and maintenance are a major factor in selecting power drives.

Power transmission systems comprise many component units for one end result.

Sound purchasing policies are based upon periodic and comprehensive analyses.

POWER transmission should be considered in terms of efficiency, effectiveness and shop habits. Beyond this, thinking is easy to focus if thinking is done in terms of entire transmissions as sequences, and of drives as sequences.

Defining Efficiency

The terms should be used with care. To employ the term "efficiency" in any other sense than that of percentage of delivered power which is transmitted is deceptive. If the motor delivers 100 horse power and 85 horse power is available at the point of work (a common average ratio), then the transmission is 85% efficient.

The deceptiveness of thinking that a power transmission is the most efficient when it causes or enables the driven machine to do the most and the best work lies in the fact that power transmission devices commonly are given catalog or engineering data sheet ratings in terms of efficiencies under various conditions. A flat belt, for example, commonly is at its highest efficiency when the belt itself is traveling at a speed between 3800 and 4200 feet a minute. If shaft RPM and pulley diameters to provide that speed are practical for the drive, then a somewhat low cost, narrow and thin belt may do the work. But if a belt speed seriously out of this range is to be used, then a wider and thicker belt is purchased at a slightly higher cost. A belt can have many other drive qualities than mere ability to transmit power—it can absorb shocks and it can dampen vibrations, for example—and therefore there is no complete relationship between the rated or achieved efficiency of the drive and the performance of the driven equipment.

Efficiency is important, but far from dominant. Loss of efficiency ordinarily results only in wastage of power. And although a dollar saved on the power bill looks as big as any other dollar on the profit and loss statement, power transmitted to actuate mechanical motions is usually the cheapest ingredient which enters into any manufactured product.

Efficiency vs. Effectiveness

Effectiveness, by contrast, is an extremely severe test of purchase engineering and of all around engineering imaginativeness. It cannot, like efficiency, be found in catalog tables or be measured by the use of simple instruments.

The easiest way to visualize effectiveness is to set up an "effectiveness potential" based first upon what the raw material in process could stand and second upon what the driven machine actually can do.

If, for example, a steel bar which is being cut in a lathe could withstand a cutting stress of 60,000 pounds and the machine is being run so slowly as to impose only 15,000 pounds, then the entire operation is only 25% effective. Conditions like this often are found on lathes which fabricate small bars and cannot be "revved up" to the RPM necessary for top cutting speeds.

Next, consider what the output would be if the driven machine were to be operated at the top limit of its present capacity and there were to be no shut downs or delays. (De-

lays caused by failures of supplies of raw materials, of course, have no bearing on machine effectiveness.)

The first step will give a picture of the goal at which the shop eventually may aim, and toward which it should progress. The second provides an effectiveness potential target for "right now".

Governing Power in Effectiveness

Based upon this second step alone, effectiveness losses on the order of 90%—the shop then running at 10% or less of effectiveness potential—are astoundingly common in industry. They are the Number One targets of all production engineering. By no means all such losses can be laid at the door of power transmission. But since a driven device can do nothing which the power transmission does not cause or permit it to do, it follows that power transmission is a major governing factor in production effectiveness.

As one example common to the metal working industries, if the effectiveness of an entire machine could be raised by the use of carbide tipped tools but the present power transmission lacks the rigidity (is too resilient) to prevent breakage of those tools, then, although it may be efficient enough to transmit all the power needed, the present power transmission is not effective.

As an example common to all industry, if a conveyor needs precise adjustment of speeds in accordance with the varying needs of the production line or the individual machine it serves, and there is neither infinitely variable speed control of the motor nor an infinitely variable speed adjuster in the power transmission sequence, then the conveyor must run at varying percentages of effectiveness in accordance with production conditions and demands.

Life Expectancy

Durability may be expected to cost money. Although there are instances in which lower cost items outlive higher cost ones, in general the greater the endurance of a power transmission device the greater its first cost and its installed cost. And the installed cost—the cost actually on the job and operating—commonly is much higher than the first or purchase cost.

Like everything else in power transmission, the value of durability depends almost entirely upon shop habits. And shop habits vary from factory to factory and may be different in departments of the same factory or even as applied to different machines.

There are two kinds of durability: (1) durability in terms of breakdown so complete as to necessitate replacement, and (2) durability at peak efficiency and effectiveness.

Although anti-friction bearings and some other devices are not subject to this rule, nearly all power transmission items go through a brief initial period of wearing in, then achieve their peaks of efficiency and effectiveness, and then have extended lives during which their effectiveness goes gradually and steadily downward, whether or not their efficiency stays up.

Losses of effectiveness of the driven equipment can be drastic as the worn power transmission vibrates, acquires imbalances with resulting rhythmic pulsating effects at the point of work, imposes varying speed patterns or "speed diagrams" upon the driven equipment, goes into operating misalignments under load although alignment may seem perfect as measured when the transmission is at rest.

Costly Power Transmission

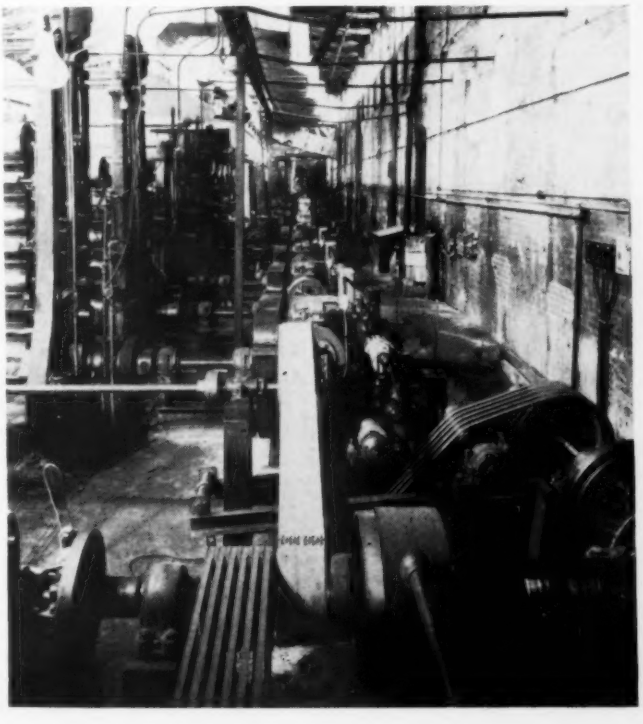
In fact, the costliest power transmission possible to operate can be that which is too thoroughly worn in and is not yet worn out. It imposes unpredictable stresses with debilitating strains upon the driven equipment. It adds enormously to the intangible losses of production which are charged to general operating overhead.

Nevertheless in many a shop the habit is to run everything at less than peak potential effectiveness and to aim at comfortable general averages. Where this habit exists an equally comfortable attitude may be taken toward buying power transmission. But where the shop habit is to get the highest returns from equipment investments, from floor space and from manpower, then the only durability of power transmission that counts is durability at peak effectiveness, and this is likely to come only at top prices for equipment.

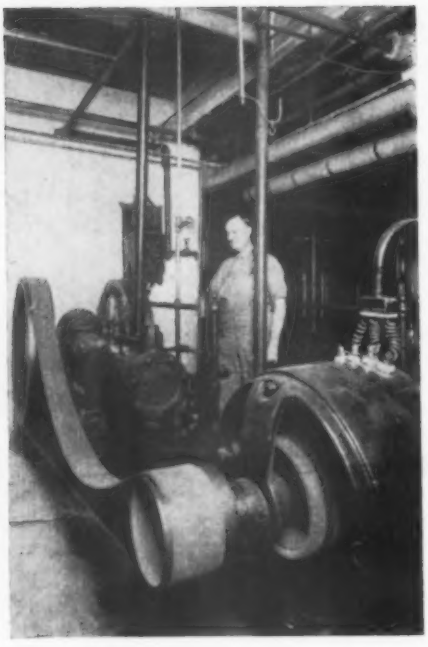
Power Transmission Salvage

Any complete power transmission can easily be visualized if the mind travels along its members as a sequence. For example, a sequence might consist of the motor shaft, motor bearings, motor pulley, belt to countershaft, countershaft pulley, countershaft bearings, countershaft take-off pulley, belt to machine, and driven pulley. Additional members of this sequence would be keys and set screws, provided they ever gave trouble enough to require consideration. Members of sequences also can be gears, chains, clutches, fixed increment or variable increment speed changers, reversing devices, and all the other items.

For detailed visualization, each complete sequence can be broken down into drives. In the example previously cited, the sequence members from the motor shaft to the countershaft bearings would be



A power transmission system consists of a sequence of many units — belts, pulleys, sprockets, shafts, bearings, clutches.



Belt width, thickness, and tension are variables that must be considered interdependently to achieve a desired result.

called the "countershaft belt drive", a drive usually being named for its principal or its most visible components.

The salvage of partly worn or obsoleted power transmission usually is in terms either of complete drives or of individual members of sequences.

Salvage can be high in value if it can be planned. In a great many shops it is possible to plan that after a transmission has lived out its highest effectiveness period on a critical machine it can be transferred to one on which reduced effectiveness is tolerable. In this way some of the high costs of long lived effectiveness can be mitigated.

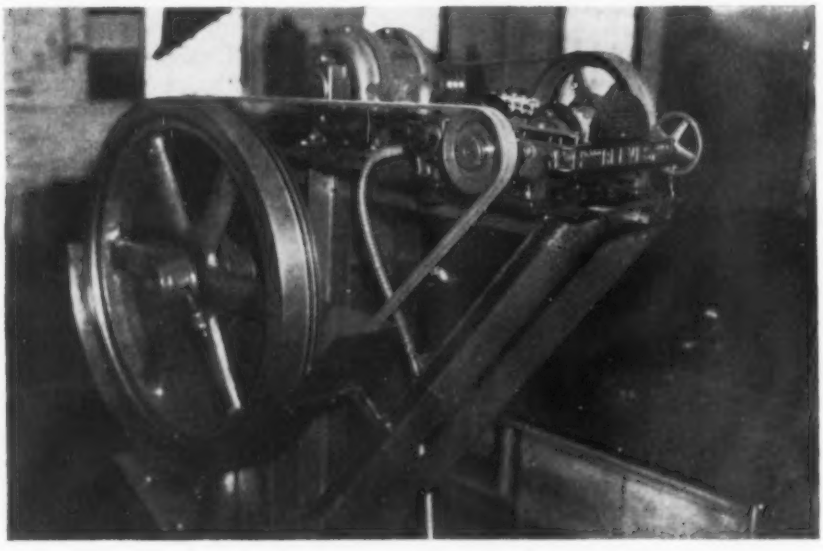
The salvage possibilities depend largely upon shop habits. If the entire plant is run at high effectiveness, then salvage may be limited to a few items such as anti-friction bearings which can be used independently of load and speed changes, and such other items as may by pure accident find usage.

Where salvage uses are definitely to be foreseen, predicted-salvage purchasing is feasible. But this practice has been known to fill stock room shelves with partly worn equipment waiting for suitable assignments to come along. The presence of such equipment may reduce power transmission budgets to the point where needed plant improvements are blocked. Power transmission salvage can be anything from a mountain of economy to a booby trap of equipment investment.

Housekeeping and Maintenance

The cleanliness and general order of the shop, and the maintenance practices rarely are within the authority of the purchase engineer. But they have effects which he must respect.

Lax housekeeping and neglected or "postponed" maintenance generally go hand in hand. And although there are exceptions to this, a tolerance for low effectiveness of machine operation is likely to accompany them.



The right drive for any piece of equipment depends on the type of work done and the shop policy in respect to rated load, speed, and output.

To some extent, the purchase engineer can counter such shop habits by his selection of power transmission equipment.

Fully encased gear reducers, motor reducers, speed changers and chain drives are preventive to some of the worst effects of poor housekeeping and bad maintenance. But such devices should be selected somewhat oversize for such conditions. Much of the life of these devices is dependent upon the ability of their casings to dissipate heat. Shop dirt on a casing is an excellent thermal insulator and will compel the retention of the heat with consequent internal temperature rises and accelerated wear of moving parts. But oversize devices not only provide more surface for better escape of heat but also can perform the same amount of work with less temperature rise.

Bearings having their life-time supplies of lubricants sealed-in also are better for these conditions.

In the majority of instances it is better to substitute bulkier and slower moving equipment for smaller high RPM items. The century-long trend in power transmission has been to use high RPM in order to get the same horse power with less torque and thus to use lighter weight equipment which requires less space. But this trend can be unprofitable if dirt and neglect are present.

Where neglected power transmission cannot be encased for protection it should be as out-in-the-open and visible as practical. A poor guard or casing is worse than none at all because it conceals the evidence of neglect and it catches more dirt than it excludes. Belts have been known to get ragged edges by rubbing against foreign materials entrapped within the belt guards.

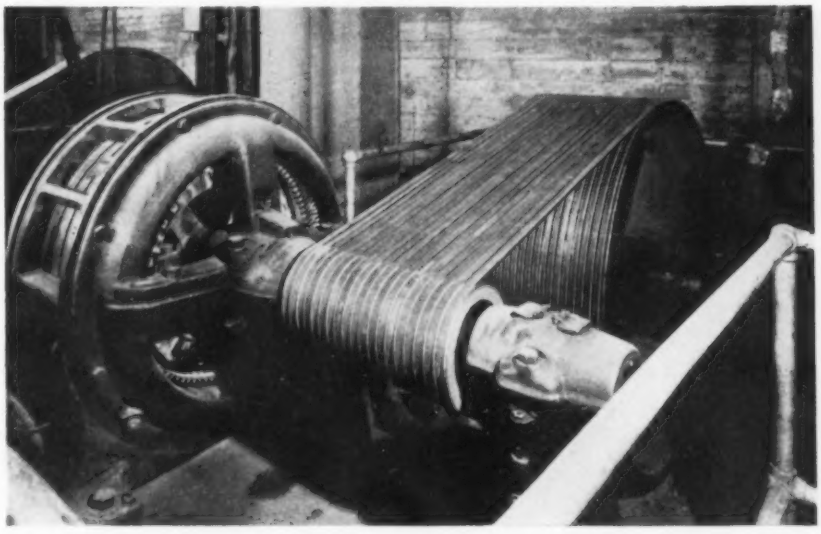
Salvage of power transmission drives and sequence members sometimes is more practical in a poor housekeeping shop than in a good one. The shop usually is less careful about full effectiveness of driven equipment and will tolerate reduced performance of power transmission —in fact, is habituated to it.

Where housekeeping and maintenance crews are "on the ball" the same types of fully encased devices also are good, but they may be bought with the idea of fitting them exactly to their tasks. The first or purchase cost in such a shop is lower, the life of the equipment at

full effectiveness is longer, and the condition of the items for salvage transfer to other duties is better.

Every kind of power transmission equipment has types which will withstand neglect and abuse and other types which are specially encased or enclosed to protect against abuse. The dangers are in purchasing types which will stand up only if properly treated. And those dangers occur because equipment which needs intelligent maintenance is likely to cost less.

In some shops, especially some types of food processing plants, the housekeeping and maintenance are good during operating seasons but



A change at any point of the power transmission system may affect the performance and efficiency of driven equipment all along the line.

the damage occurs during long shut downs. Bearings and other slightly open parts can actually "breathe"—inhale and exhale air—if they are idle and wide fluctuations of temperature occur about them. Any department subject to extended shut downs can have this trouble.

Plans usually are made for overhauling the equipment just before starting up, and at these times the damaged parts are replaced. The purchase engineer then should either buy power transmission equipment which is so thoroughly encased that dust and moisture laden air will not enter during shut downs, or else work toward complete accessibility and ready demountability for inspection and maintenance in the rush period which occurs just before reopening.

Complete power transmissions, individual drives, or single members of sequences, may be changed in sizes and types and qualities to meet new situations or solve old ones. In some plants this is compartively rare and in others it happens so often as to amount to a shop habit.

Modernizations and Changeovers

When it is planned to install a single improved member in a power transmission sequence, the production and maintenance engineers should be requested to review the entire transmission and also the prime mover and the driven equipment for possible effects.

A belt which has been slipping slightly may have been acting as a friction clutch and thus saving the prime mover and the driven equipment from shock load damage. If replaced with a belt which will not slip, or with any other form of positive drive, there may be brush troubles at the motor, bearings failures in the sequence, other troubles which never are blamed on positiveness of drive. In other instances the belt slip may have been the very factor which caused those troubles, and improvements never ordinarily credited to more positive drives may appear.

Replacement of Devices

Plain bearings can have steadying effects upon sequences; their replacement with anti-friction bearings can lead to vibration and to overrunning load and to backlash troubles unless other members of the sequence are changed to prevent these hazards. Every kind of power transmission device has contributions which are likely to disappear or to require compensating changes if the device is replaced with another kind.

The point is not to avoid modernization of small details lest it bring troubles, but to make sure that it goes far enough.

Modernization of entire sequences can have astonishing effects. When the redesigning of power transmission has been necessary to get it out of the way of a new conveyor system, plant engineers have been heard to remark: "The machines seem to work better now that we have gotten the conveyors in," not stopping to realize that the increased effectiveness had been available for years if only new power transmissions had been installed.

When changeover is frequent, a discussion of purchasing practices should be held with the production and maintenance engineers at least once a year.

Wise Decisions

Decisions must be made as to whether to keep the plant adaptable in terms of buying whole units such as gear reducers which can be changed as needed and at will, or to use more belt and chain drives so that small units of sequences can be changed readily, or to install more variable speed devices so the changing of a speed is a mere matter of turning a hand wheel.

Decisions on these matters obviously will depend upon how drastic and how frequent the changes are to be. But in too many plants no conferences are specifically focussed on power transmission unless a big installation is coming through or severe trouble is being experienced; therefore no one really thinks power transmission through from the working areas of the driven machines and to the suppliers with which the orders are placed.

There is no matter which can be better served by the habit of walking through the shop and observing conditions. Power transmission devices exist in such myriads of kinds, types and sizes because the vagaries of shop habits have needed all of them. Shop habits cannot be described, laid down in formal policies nor blue printed. But shop habits can be observed, and meeting them or coping with them is the basis of all economy in the purchasing of power transmission.

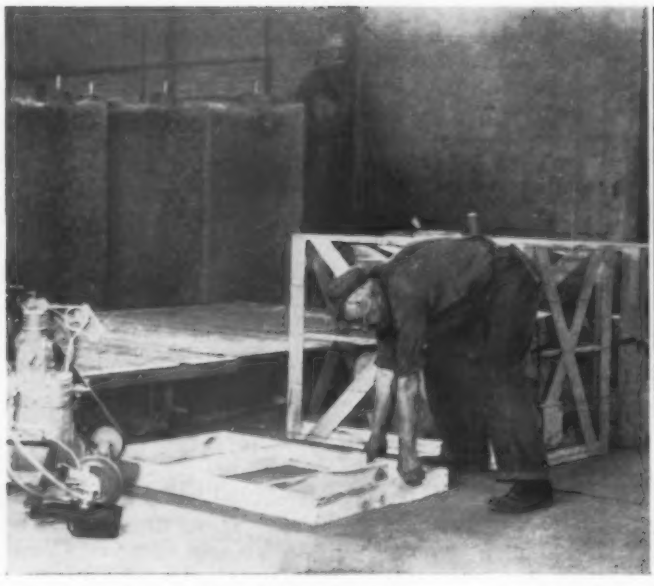
Savings Through Better Packaging

Case study of a crate design that solved shipping problems.

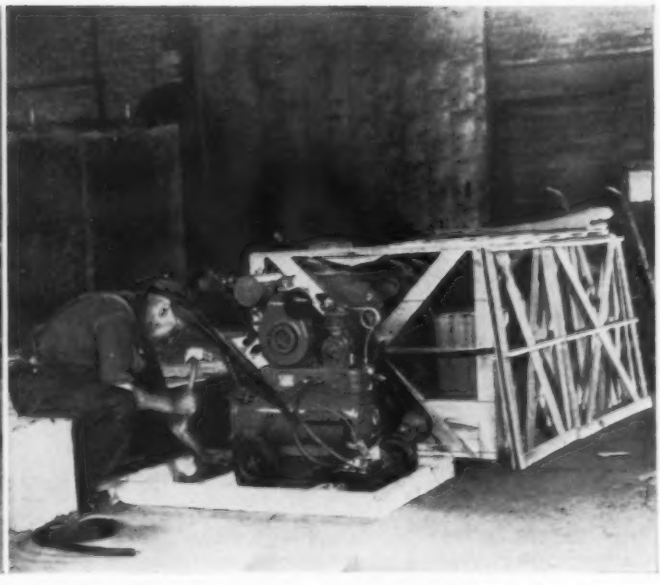
Material cost down 30%; shipping weight reduced by 75 pounds.

Better protection, pilferage eliminated, time and space saved.

By G. C. Spencer



A sturdy prefabricated base is put on the packing room floor as the foundation for the crate and start of the packing procedure.



The road marker is set into the base, with its wheels blocked by the partitions, and firmly secured by means of steel brackets.

WHEN a purchasing agent saves his company 30% in crating costs and, at the same time, eliminates damage and pilferage during shipment, saves floor space, reduces freight charges, and helps to build good will with customers, he has done about all a purchasing agent could possibly do in the field of shipping containers.

All this has been accomplished by R. W. Kuchma, Purchasing Agent for the Meili-Blumberg Corporation of New Holstein, Wisconsin, manufacturers of road stripers, road-making equipment, and tilt-top trailers.

Mr. Kuchma was largely instrumental, about a year ago, in changing company practice from the use of a hand-made crate to a factory-made, scientifically engineered wire-bound crate for shipping its 285-pound road striper. A change of some sort was imperative because of serious damages resulting from failures of the hand-made crates, as well as considerable losses from pilferage in transit.

In casting about for a safer and more economical shipping container, Kuchma and other company officials, including Vice President Eugene Wulff, conferred with wire-bound shipping container engineers. They studied the company's problem and designed the crate that has now been adopted. According to Messrs. Kuchma and Wulff, supported by the evidence of a year's actual experience with the new method, this change has resulted in complete elimination of damages and pilferage, plus marked economies in cost and increased customer good will.

Here are the facts, as disclosed by M-B officials:

1. Over-all cost of crating a road striper in the present wire-bound container is 30% less than with the old style hand-made crate.

2. Container weight has been reduced from 130 to 55 pounds, or 65%.

3. Shipping weight has been reduced from 415 to 340 pounds, or

18%, with consequent savings in freight charges.

4. Damage and pilferage during shipment have been eliminated.

5. Factory space formerly required to store lumber and make crates has been reduced.

6. Many complimentary comments have been received from dealers and customers on the neat appearance of the new crate and the ease of unpacking.

Mr. Kuchma reports that the results of this change-over to wirebound crates have been so dramatic that the engineers are now working on similar projects to solve packaging problems presented by much of the heavier equipment made by the Meili-Blumberg Corporation.

One of the outstanding features of the present method of crating is its simplicity. A specially fabricated crate base, made of 2 x 4 lumber, is laid on the shipping room floor. The road marker, practically completely assembled, is placed upon this base and firmly held in place with two steel brackets nailed to the wooden members.

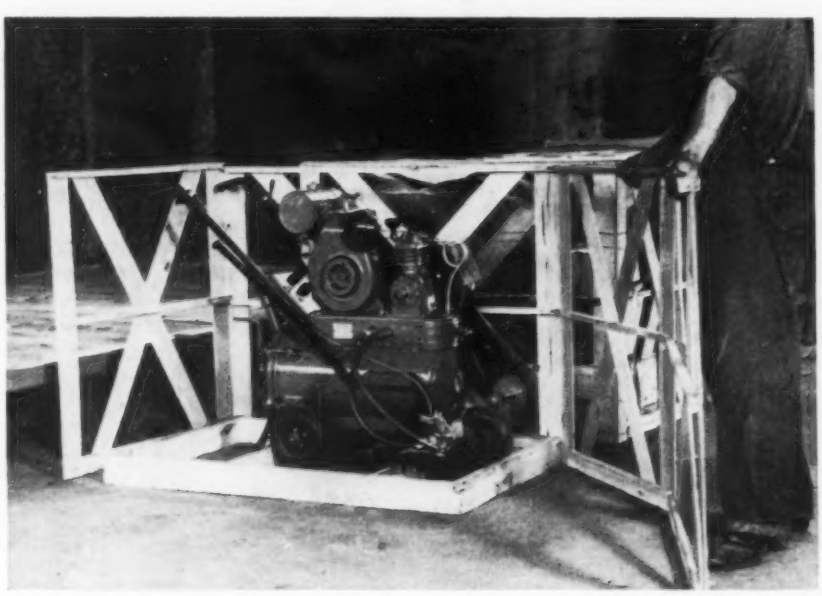
The one-piece wirebound wrap-around "mat" is folded into shape to form the four crate sides. It is fitted snugly around the base and attached with a few nails. A weatherproof bag is slipped over the machine. An inexpensive piece of interior packing is fitted over the paint guns and shields of the marker as further protection against pilferage, and a carton containing accessories is placed atop it and fastened to the crate sides with steel strapping. Then the crate top is put into position and fastened by nailing.

Only 19 minutes have elapsed from start to finish of this packaging procedure!

The crated road markers are stacked two-high while awaiting shipment, and are stacked even higher in many warehouses, without danger of bottom crates collapsing under the additional load. They have been shipped by truck and by LCL and carload rail freight with equal satisfaction as to the serviceability of the packaging method.

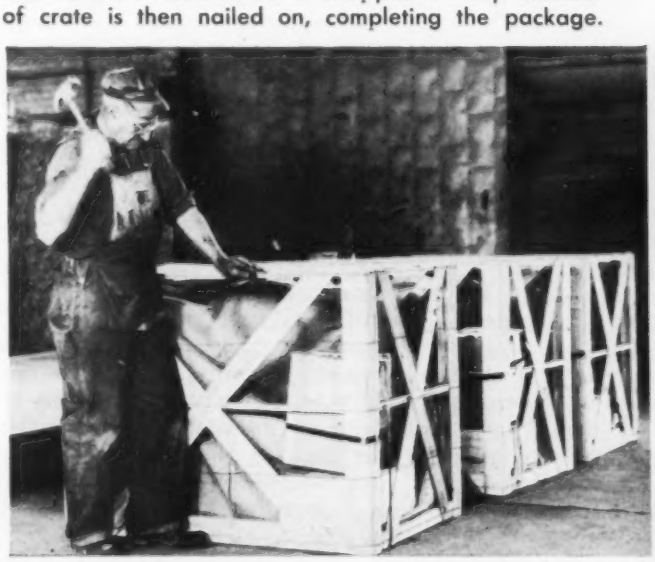
One of the "extra dividends" enjoyed by this manufacturer as a result of the change is the pronounced favorable reaction of dealers and customers to the neatness of the crates themselves, the undamaged condition of the equipment upon arrival at destination, the fact that they are shipped completely assembled, and the ease with which they can be unpacked.

Vice President Wulff is impressed by the part that purchasing played in this project. He comments that the experience demonstrates effectively how the purchasing agent's influence is often felt far beyond the limited realm of price, sources of supply, and procurement.



The one-piece wirebound "mat" is folded into place, forming the sides of the crate. It is nailed to the base, and wire ends are twisted to form a tight crate closure.

Special protective interior packing covers the machine, and carton of accessories is strapped in. Top member of crate is then nailed on, completing the package.



Finished crate is neat, strong, weatherproof and pilferproof. Crates can be stacked for shipping and storage, without damage to crate or contents.

New Contract Law

Recent court decisions modify interpretation of established law.

Contract clauses can bar testimony relating to oral agreements.

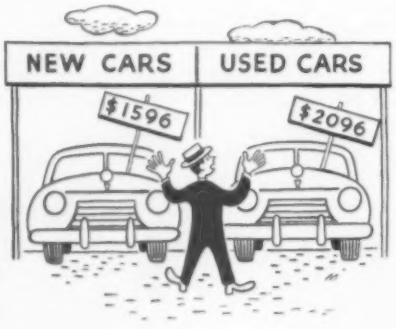
Determining factors on seller's liability for damages under contract of sale.

● **By Leo T. Parker**

DURING the course of the past year the higher courts rendered a number of new and outstanding decisions affecting purchasers. Several of these new decisions clearly reverse the older law. Readers will do well to familiarize themselves with these developments and to file this article for future reference.

Must Prove Damages

Considerable discussion has arisen from time to time over the legal question: Is a contract valid by which a purchaser agrees to pay the seller damages if he resells the merchandise or equipment at a profit? The answer is "No" if the seller fails to prove that he was damaged.



For instance, in Schuler v. Dearning Chevrolet Company, 46 S. W. (2d) 611, it was shown that an authorized Chevrolet dealer sold a certain Chevrolet automobile for $1,596.00 to one Schuler. Schuler agreed in writing that if he should decide to sell the car within a period of 6 months he would give the seller an option of first refusal to re-purchase it for the original purchase price. Schuler breached this contract and sold the automobile to a used car dealer for a profit of $500.

The higher court refused to allow the seller damages because he failed to prove that actually he was damaged. In other words, the seller did not allege and prove that he could have resold the automobile above the list price.

Verbal Agreement Barred

According to a recent higher court, a clause in a written contract is valid which prohibits or cancels oral agreements.

See Boro Hall Corporation v. General Motors Corporation, 164 Fed. (2d) 770. Here it was shown that a contract contained this clause: There are "no oral or other agreements or understandings", between the contracting parties.

In subsequent litigation the higher court held that this clause prevented both contracting parties from introducing testimony of verbal conversations.

Also, see Zone Company v. Service Company, Inc., 57 Atl. (2d) 562. Here the testimony showed that a purchaser bought 330 gallons of heavy duty roof coating. The written sale contract contained this clause: "It is mutually agreed between buyer and seller that this order contains the entire agreement of the parties and neither customer nor seller shall be bound by any agreements not contained in the original of this order."

The buyer refused to accept delivery of the roof coating on the grounds that at the time the written agreement was signed the seller's salesman promised that shipment would be made at once, and that the shipment was not made until more than a month later.

The higher court held:

"In action on a sales contract stipulating that the writing embodied the entire agreement and that neither seller nor buyer was bound by agreements not contained therein, evidence of extrinsic agreement for delivery at fixed time and by specified carrier was inadmissible as in contradiction of agreement."

Seller Breached Two Contracts

All courts agree that where a seller breaches a contract, a new contract is valid by which the purchaser relieves the seller from damages. However, according to a recent higher court the purchaser may base his suit on the first contract if the seller breaches the second contract.

For illustration, in Crown Products Company v. California Food Products Corporation, 175 Pac.

(2d) 861, the testimony showed facts, as follows: On January 20, 1941, a buyer and a seller signed a written contract whereby the buyer agreed to buy "during each of the years 1941, 1942 and 1943, a total of not less than 300,000 gallons and not more than 400,000 gallons 59½ grain cider vinegar". The contract provided that "the price of this vinegar shall be five cents per gallon, less two percent payment in five days from shipment".

In 1941 the parties *orally* agreed that the price of the vinegar should be changed to six cents per gallon, and in 1942 they orally agreed that such price should be seven and one-half cents per gallon. At no time during the contract period did the seller deliver the quantity of vinegar he had contracted to deliver. For the year 1942, the seller delivered 209,403 gallons and the year 1943, he delivered 73,879 gallons; and for the year 1944, only 5,586 gallons were delivered.

Letter a Valid Contract

The buyer and seller discussed the question of shortages in the deliveries. At that time the buyer told the seller that he did not desire litigation, but he did not feel that the seller had dealt fairly with him, but that if the seller would agree to deliver the full 350,000 gallons called for by the contract for the 1943-1944 period the buyer would agree to waive the past defaults. As a result of this conversation the seller sent to the buyer a letter dated August 30, 1943, which provides: "Confirming conversation between you and writer, of a week ago, we are to deliver to you between present time and October 1, 1944, 350,000 gallons of 60-grain cider vinegar at the same price as we have been billing, which is 7½ cents a gallon. This delivery will be in full for existing contract in force at present. . ."

The buyer acknowledged this letter, and thus the contents of the letter became a valid contract. Only a few weeks later the seller told the buyer that he refused to make any further deliveries unless the buyer agreed to an increase in the price. According to the buyer's testimony, the seller then told him that "if you want to have any more vinegar you have to pay me ten cents a gallon for that vinegar or otherwise we will stop making deliveries."

The buyer sued the seller for damages based on *all* short deliveries made during 1941, 1942, 1943, and 1944.

During the trial there was evidence that there was no vinegar available to the buyer at any price on the open market from August, 1943, to September, 1944, and also evidence that the price of vinegar had gone up to 20 cents a gallon.

The seller argued that the purchaser could not in any event recover damages for non-deliveries during 1941, 1942, and 1943 because the new agreement made in the August 30, 1943 letter cancelled all liabilities for prior breaches of the contract.

In holding the seller fully liable to the purchaser for delinquent deliveries in 1941, 1942, 1943 and 1944 the higher court said:

"Both agreements concerned and related to the same transaction. The 1943 contract, at most, simply modified several of the terms of the 1941 contract. Thus the 1943 contract modified the 1941 contract by extending the time of delivery, changed the price for 1943-1944 deliveries from 5 cents to 7½ cents, and changed the type of vinegar from 59½ grain to 60 grain. . . The most that can be claimed for defendant's (seller's) position is that the second contract modified the first, but it cannot be doubted that the second was clearly within the scope of the first. . . As already pointed out there had been violations of the original contract."

Purchaser Gets $20,000

Under all circumstances a purchaser who intends to resell purchased merchandise may recover full damages from a seller who breaches a contract.

In Springer v. O'Brien, 190 Pac. (2d) 341, the testimony showed facts, as follows: A manufacturer appointed one Springer as sole distributor of its products for the term of two years. As consideration for the exclusive franchise or agency Springer paid the manufacturer $4,000. Springer immediately upon signing of the contract undertook to sell the products, established a warehouse, traveled throughout the territory, engaged local dealers, solicited and obtained orders, but the manufacturer refused to furnish or ship the accessories ordered out by Springer.

Springer sued the manufacturer for $20,000 damages. The lower court held in favor of Springer and the higher court approved the verdict.

Must Prove Breach

According to a recent higher court no purchaser may recover damages from a seller for breach of a sale contract unless definite proof is given that the purchaser fulfilled his obligations and the seller breached his obligations.

In Joseph Wasserman v. Broadalbin Knitting Company, 72 N. E. (2d) 11, a purchaser sued a seller for damages for alleged failure of the latter to deliver merchandise specified in a written contract.

The higher court refused to allow the purchaser any damages because he failed to prove that he had fulfilled his assumed obligations, and that the seller had breached the contract.

Breach Invalidates Contract

Modern higher courts consistently hold that the instant one contracting party breaches a contract, the other party is relieved from all further obligations.

For illustration, in McManus v. Bendlage, 187 Pac. (2d) 854, it was shown that one Bendlage agreed to sell and deliver on a specified date to one Kohlsaat the secret formulae and processes, patent rights, trademarks, copyrights and trade names, all assets, books and records of his business for a stated cash sum, plus additional monthly payments. Bendlage failed to turn over the secret formulae on the date specified in the contract.

The higher court held that this breach on the part of Bendlage relieved Kohlsaat from any further obligations. This court said:

"The breach of the contract by appellant (Bendlage) was a breach of the entire contract and discharged respondent (Kohlsaat) from any of the conditions to be performed. The contractual relation ceased to exist."

Impossible to Make Delivery

A seller can't expect to be relieved from obligations of a contract of sale on the plea that it was impossible for him to deliver the merchandise.

In Rawjee v. Hatton, 180 Pac. (2d) 382, it was shown that a buyer

and seller entered into a contract for sale of seed.

The seller failed to make delivery and proved that it was impossible for him to do so because of a fire that destroyed his warehouses in which the seed was stored.

The higher court refused to excuse the seller and, in holding the purchaser entitled to $7,200 damages, said that the seller should have had insurance to protect him against such losses. This court also said that a seller and not the purchaser shall be penalized where the seller finds it "impossible" to fulfill the terms of a sale contract.

Can't Attach Assets

Generally speaking, a seller cannot attach a purchaser's assets and keep him from disposing of assets while a damage suit is in court.

According to a recent higher court, attachment proceeding can be filed against a purchaser who breached a sale contract only if (1) the seller sued for a stated sum of money, or (2) the case is adjudicated in a lower court. If the amount of damages must be decided by a jury no attachment will be granted until the jury renders its verdict allowing the seller a definite sum of damages.

See Friedman v. Mandelbaum, 51 Atl. (2d) 260, where a seller sued a purchaser upon an alleged breach of a sale contract for 100,000 yards of cloth. The seller's claim arose out of loss of his contemplated profits.

The seller asked the court to immediately issue an attachment of the purchaser's assets. The court refused to grant the attachment because the seller failed to sue the purchaser for a definite sum of money, as damages.

Buyer Inspected Trucks

Recently a higher court was asked to decide: When is a seller *not* liable to the purchaser who proves that the merchandise was defective and unsatisfactory? The answer is: When the seller gave no guarantee and the purchaser examined or inspected the merchandise before purchasing it.

For example, in Beers v. Martin, 190 Pac. (2d) 573, the testimony showed that a seller sold and delivered three trucks to a buyer who promised to pay the sum of $22,000. A check given by the buyer as payment for the trucks was returned unpaid to the seller, who then sued the buyer for $22,000.

The buyer defended the suit by proving that shortly after delivery of the trucks trouble developed with the tires, and mechanism.

Since the buyer had inspected the trucks before purchasing them and the seller had not given any specific guarantee, the higher court ordered the buyer to pay the seller $22,000, and said:

"The parties originally intended to, and did, enter into the contract for the sale of the trucks. The lower court found that there was no warranty on the part of the seller; that the purchasers were experienced and had an opportunity to observe and examine the trucks before the sale; and that they knew what they were buying."

Price Is Uncertain

Recently a higher court held that any contract is valid which specifies how a price for merchandise can be established, although no definite price is stipulated. Hence a contract is valid by which a buyer agrees to pay the top price being paid by other purchasers.

In Stockman v. Farmers Union Central, 190 Pac. (2d) 407, the testimony showed that a contract provided that the selling price of seed corn would be the top price being paid by The Union Elevator on the day delivery was made to the purchaser.

The purchaser refused to pay for the seed corn on the contention the contract and method of arriving at a price for the corn was invalid, uncertain and ambiguous. The higher court ordered the purchaser to pay for the corn, saying:

"The contract is simple and unambiguous in its terms. . . The contract specifically provided for the privilege of establishing a price. . . There is nothing equivocal or ambiguous about it."

Must Pay Bill

Modern higher courts consistently hold that if testimony shows that when a contract was signed, the parties intended at the time to be obligated, the contract is valid and enforceable.

For example, in Stratford Credit Corporation v. Berman, 54 Atl. (2d) 404, the testimony showed facts, as follows: A contract and note both were on the same printed form. The two instruments were separable by perforations in the paper. The signature to the note served also as the signature to the contract. Controversy arose and the signer claimed that he was not liable on the contract because perforations separated the note from the contract, and he had signed only the note.

Notwithstanding these contentions, the higher court held that the signer must pay the amount of the note and comply with the contract. The court said:

"He signed the contract and note with full knowledge of what he was doing. . . That the note was separable from the contract through minute perforations in the paper may, of itself, be of minor import. ."

Valid Consideration

No contract is valid and enforceable unless based on valid consideration. According to a recent higher court a mere promise is valid consideration.

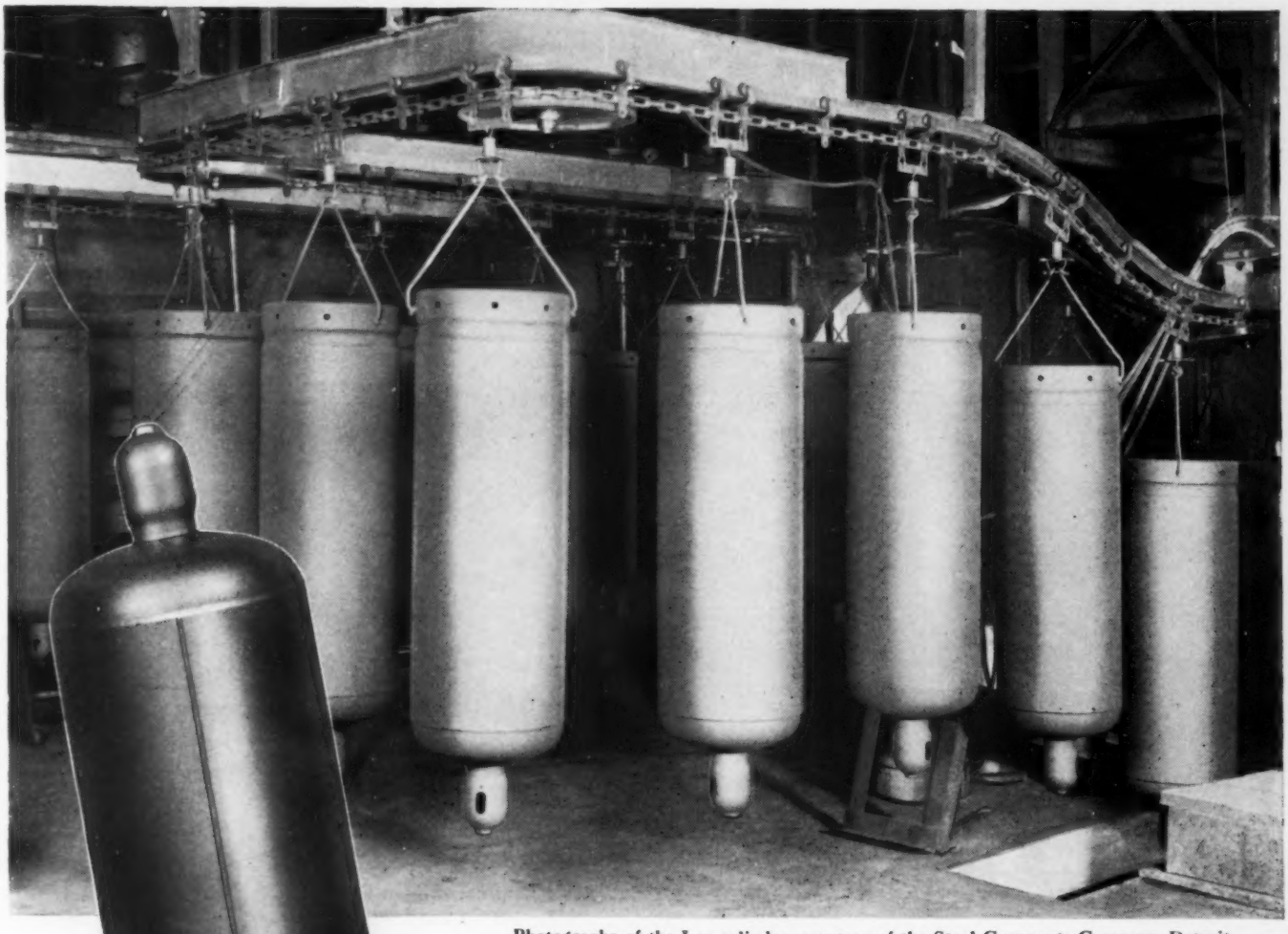
In Brightwater Paper Company v. Monadnock Paper Mills, 68 F. Supp. 714, it was shown that a paper mill contracted to manufacture and sell to a purchaser a type of paper required by one of the purchaser's customers. The purchaser agreed to order from the mill all such paper required by this customer.

The higher court held this promise valid. The court explained that this promise was an inducement to the mill to manufacture paper for the purchaser and that the contract was valid because the promises of each the paper mill and the purchaser were "valid consideration". This court said:

"There was adequate consideration and mutuality between the parties. . . The main and supplemental contracts with respect to this business were valid bilateral agreements."

N-A-X HIGH-TENSILE STEEL in L.P.G. Cylinders

means light weight with added safety and durability



Photographs of the Lee cylinder, courtesy of the Steel Cooperage Company, Detroit.

Because of the greater strength and excellent fabricating, welding and copper brazing properties of this low-alloy, abrasion- and corrosion-resisting steel, cylinders made with it (to conform to I.C.C. safety requirements) are 35% lighter in weight than when made with conventional carbon steel.

This weight reduction (with longer life) means greatly reduced shipping and handling costs . . . and over-all savings to consumers.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
N-A-X
HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION

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GREAT LAKES STEEL CORPORATION

Want Additional Product Information? See Page 19.

Considerable discussion has arisen from time to time over the legal question: If a purchaser pays a seller an amount greater than a price specified in a contract, can the purchaser sue and recover the overcharge? According to a recent higher court money paid voluntarily and without compulsion, fraud, duress or extortion *cannot* be recovered.

No Refund

For illustration, in Pure Oil Company v. Tucker, 164 Fed. (2d) 945, the testimony showed that a buyer and seller made a written five year contract with prices for the merchandise clearly listed in the contract.

In subsequent suit the buyer alleged and proved that the seller had charged him more for certain products than the price specified in the contract. Tucker asked the court to award him $10,188, the overcharge. However, the higher court held that since Tucker had voluntarily paid the seller for products sold to him under the contract, he could not recover an overcharge.

Fraudulent Debt

It is well established law that a debt fraudulently incurred by a purchaser will *not* be discharged in bankruptcy. However, according to a recent higher court, a fraudulent debt may be reduced to a note and this new liability is discharged in bankruptcy.

In Shawano Finance Corporation v. Haase, 30 N. W. (2d) 82, it was shown that a company's president falsely represented facts to a seller. Upon the discovery of the falsity of these representations, the seller made demand on the president for restitution, whereupon the president signed a note.

Later the president became a bankrupt. The higher court held that although the president made false representations to the seller, yet acceptance of the president's note by the seller reduced the debt to a contract liability and the president's debt on the note could be discharged in bankruptcy proceedings.

Usurious Finance Charge

All higher courts hold that it is valid for a seller to have a low *cash* price, and a higher *credit* price on an automobile. But it is illegal to have a finance charge greater than lawful interest on the balance due on the purchase price.

For illustration, in Associates Inv. Company v. Ligon, 209 S. W. (2d) 218, it was shown that one Ligon agreed to pay a purchaser $1,300 for an automobile. Of this amount he paid the seller $740 cash, leaving $560 owing, which amount the parties understood was to be obtained from a finance company. Before the car was delivered, or the sale completed, the seller and Ligon went to the office of the finance company where a conditional sales contract was entered into which recited that the "cash price" of the car was $848, the "down payment" $288; the cash, "deferred", balance, was $560; the "total finance charge and insurance premium for which credit is extended" was $197.50; and the "time balance" was $757.50.

Included in this contract was Ligon's note payable to Baxter for $757.50, payable in fifteen equal monthly installments of $50.50, with interest after maturity only.

The higher court held that the balance on the purchase price of the automobile for "total finance charge and insurance premium" of $197.50, including $53.21 for insurance, was usurious because the finance charge was not a part of the credit price. Hence the purchaser could not be compelled to pay for the amount due.

Innocent Suffer

Recently a higher court held that if a person gets possession of merchandise through fraud, he cannot give a valid bill of sale. Hence the owner of the merchandise can get possession of it from one who purchased it in good faith from the possessor. However, this is not the law if the seller's negligence caused the purchaser to make the contract.

See Pool v. George, 209 S. W. (2d) 55. The testimony showed that one James represented himself as being on leave of absence from the United States Navy. He presented spurious credentials and upon the strength of these credentials a seller sold him a Chrysler automobile taking a check for $1,613. The car and a bill of sale reciting a cash transaction and warranting the car to be free of all encumbrances, were delivered to James on Sunday. When the seller deposited the check on Monday it discovered that the check was no good. Seven days later James sold the car to one Pool and delivered the title papers already referred to. Pool paid James $1,200 in cash for the car.

When the original seller discovered that Pool had purchased the automobile he sued Pool for possession of the car. The higher court refused to hold in favor of the sales company, saying:

"The law applies the maxim that, where one of two innocent persons must suffer, the loss must fall upon the one by whose act it was occasioned."

This court held that when a seller delivers equipment or merchandise, and also papers indicating a clear title in the possessor, the seller cannot recover possession of the equipment from one who had purchased it in good faith from the possessor.

Thief Has No Title

According to a recent higher court, under *no* circumstances may a purchaser of stolen merchandise have legal title to it. This is so because a thief can convey no title valid against the rightful owner.

For example, in Gay v. Huguley, 34 So. (2d) 712, the testimony showed that one Kirkland bought certain equipment from a seller named Gay, paying $1,600 for it. Later the testimony showed that before Gay obtained possession of the car it had been stolen.

The higher court held that the true owner could recover possession of the car from Kirkland and said:

"It is of course basic that a thief can convey no title valid against the rightful owner, regardless of the *bona fides* of the purchaser. Possession cannot, under such circumstances, create any *prima facie* evidence of ownership as against the true owner."

CRIMPING that puts the CRIMP in SCREEN COSTS

"HOW COME 90% MORE WEAR?" The answer's easy . . . it's Roebling ROEFLAT, an improved kind of wire screen. The wire lies flat except at the short crimps . . . has 75% more wearing surface . . . gives up to 90% more working life and wear with no sacrifice of working area . . . slashes screen costs.

But ROEFLAT users get other profitable advantages, too. ROEFLAT'S smooth, level surface causes less clogging and blinding than ordinary screens. Its precision openings assure uniform grading and new screening efficiency.

Roebling ROEFLAT is available in practically any type of construction, such as ROETON, ROESLOT or square mesh, with openings of ⅝-inch or larger. Before placing your next screen order, find out whether ROEFLAT will give *you* improved service. Write for Catalog W-903. John A. Roebling's Sons Company, Trenton 2, New Jersey.

WRITE OR CALL THE ROEBLING FIELD MAN AT YOUR NEAREST ROEBLING OFFICE AND WAREHOUSE

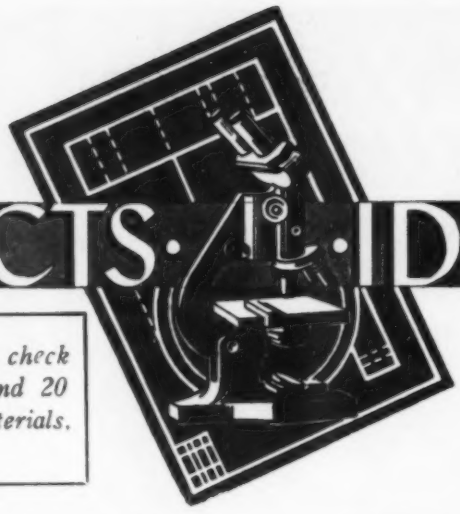
Atlanta, 934 Avon Ave. ★ *Boston*, 51 Sleeper St. ★ *Chicago*, 5525 W. Roosevelt Rd. ★ *Cleveland*, 701 St. Clair Ave., N. E. ★ *Denver*, 1635 17th St. ★ *Houston*, 6216 Navigation Blvd. ★ *Los Angeles*, 216 S. Alameda St. ★ *New York*, 19 Rector St. ★ *Philadelphia*, 12 S. 12th St. ★ *Pittsburgh*, 855 W. North Ave. ★ *Portland, Ore.*, 1032 N. W. 14th Ave. ★ *San Francisco*, 1740 17th St. ★ *Seattle*, 900 First Ave.

ROEBLING

☆ A CENTURY OF CONFIDENCE ☆

Want Additional Product Information? See Page 19.

New PRODUCTS · IDEAS



Purchasing Agents and their Assistants are invited to check the pre-paid "Ask Purch" postcards on Pages 19 and 20 for late catalogs and bulletins on New Products, Materials, Finishes, Equipment, etc.

MERCURY TYPE RELAYS

"HYDROGEN arc-quenched" mercury type relays operate the "double flow" principle. Contacts are between two pools of mercury, in the presence of hydrogen gas under high pressure, keeping arcing at a minimum. Heat and corrosion are virtually eliminated, it is claimed. Four types of action available with normally open or normally closed contacts: quick operate-quick release; quick operate-slow release; slow operate-slow release; slow operate-quick release. *Durakool, Inc., Elkhart, Ind.*

NEW RACK COATING TAPE

ORANGE - colored Wrap-Rax, a synthetic resin in easy - to - use tape form for insulating plating racks is effective as a stop-off in hard chromium and other plating solutions. Features include: durability; chemical resistance to all cleaning, pickling and plating solutions commonly used; uniform coverage; cleanliness and safety. Furnished in 250 ft. rolls, ¾" wide. Can be used on both old and new racks. *Hanson-Van Winkle-Munning Co., Matawan, N. J.*

PLASTIC FACE SHIELD

LIGHTWEIGHT, durable plastic face shield is designed to be worn in combination with American Optical R-1000 and R-2000 respirators. It protects the eyes and major part of the face against the impact of foreign particles striking from the front. Outer edges of the shield are protected by a vinyl plastic binding. It may be worn over regular prescription glasses. *American Optical Co., Southbridge, Mass.*

COMBINATION PRODUCTION STRAPPING TOOL

STRAP-O-MATIC combination strapping tool tensions, cuts and seals in a matter of seconds. The job is done in three easy, natural motions. The tool can be easily adapted to any production line operation. Companion feature is a counter-balance, free-swinging arm built to carry and hold the tool in the correct strapping position at all times. Tool holds from 75 to 100 seals, depending upon size of strap being used. *Brainard Steel Co., Warren, O.*

TRAILER LOADING DEVICE

ILLUSTRATION shows operation of the Leva-Dock, a hinged platform with hydraulic jack, which adjusts itself to varying truck bed levels. This makes it possible to load directly into or unload from trucks or trailers, either by hand trucks or power vehicles, without using steel plates, bridge ramps, or other slow or dangerous methods. *Rotary Lift Company, Memphis 2, Tenn.*

POWDERED HAND CLEANER IN HANDY CONTAINERS

MAGNUS powdered hand cleaner is now available in handy 5 lb. containers designed for industrial plants and others having wall-mounted dispensing units in washrooms. Dispensers can be refilled direct from the new package, which is provided with a pouring spout. It is said to eliminate waste of time and material and to provide better stock control of cleaner. *Magnus Chemical Co., Inc., Garwood, N. J.*

SELF-WINDING REEL

THIS Zoo self-winding balance reel suspends portable tools for use on the production line, and raises them out the way when not needed. Reel tension is easily regulated to balance any tool weighing up to 10 lbs. Tension nut and lock are located on the same side of the reel housing for quick adjustment. Reel is mounted within a heavy duty cast aluminum alloy housing that is dirt and dust proof. Literature available. *Aero-Motive Mfg. Co., 1803 Alcott St., Kalamazoo 24, Mich.*

SILICON BRONZE FIRE EXTINGUISHERS

NEW line of Alfco 2½ gallon resistance welded silicon bronze fire extinguishers replace the riveted and copper fabricated units of the same capacity. They are soda-acid; foam; plain water; and anti-freeze water types. Each is lighter in weight by 4½ lbs. and is said to be much stronger than previous models. Literature available. *American-LaFrance-Foamite Corp., Elmira, N. Y.*

REFLECTOR LAMPS

R-40 150-watt reflector flood and spot lamps have a rugged, medium skirted mechanical base that cannot come loose, drop out or sag in bullet shaped holders and recessed fixtures. Overall length of the lamp is approximately that of cemented base lamps, so that they fit the same fixtures with no change in light distribution, appearance or operating temperature of the fixture. *Champion Light Works, Lynn, Mass.*

(*Please turn to page* 150)

Facts you should know about

General Electric SLIMLINE

greatest lighting advance since the first fluorescent!

Note difference in size between slimline (A) and regular fluorescent (B)

NOW AVAILABLE IN QUANTITY!

New streamlined appearance.
Instant start—no starters needed.
Higher efficiency.
Lower maintenance cost.
Three brightness levels with one lamp.
Simplified wiring. Better light control.
Cooler. Long life.

General Electric slimline fluorescent lamps—world's newest, most advanced source of light—are now available in quantity!

They offer you these sensational new advantages: streamlined appearance (sizes range from 8′ long—1″ diameter for general lighting to 42″ long—¾″ diameter for special lighting), instant starting, higher efficiency, cooler operation, lower maintenance cost, and elimination of starters. All the advantages have been proved in many actual installations.

Before you install new lighting, get the facts on fluorescent from your General Electric Lamp supplier. He'll show you how lighting can help modernize your plant, increase efficiency and employee morale. And he'll show you how well G-E slimlines rate on every count—efficiency, maintenance, appearance, long life.

It pays to consult your G-E lamp supplier on any lighting job. More than anyone else, he has the experience and research back of him to give you the best lighting for your money. General Electric, Nela Park, Cleveland 12, Ohio.

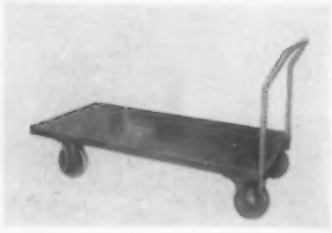
SLIMLINE FLUORESCENT LAMPS

You can put your confidence in—

GENERAL ELECTRIC

Want Additional Product Information? See Page 19.

INDUSTRIAL FLOOR TRUCK



LOAD Carrier Jr. industrial floor truck is 30″ wide with 60″ length of loading space between end racks; 63⅝″ overall length. It has a maximum capacity of 2500 lbs. distributed load. It is furnished in tilt type, non-tilt type, wagon type, dolly type. Wheels can be 4″, 6″ or 8″ diameter, of semi-steel, aluminum, cushion rubber, hard rubber or plastic. Rounded edges and corners make for safety to operator and material carried. *Market Forge Company, 30 Garvey St., Everett 49, Mass.*

READY-TO-USE EMULSION CLEANER

MUL is a ready-to-use emulsion cleaner which combines solvent and emulsion cleaning with the synergetic action of soil penetrating agents. These prepare waxy and greasy buffing and grinding compound ingredients for removal by the emulsion. The cleaner resists hard water attack and minimizes curd formation. It is inhibited against foaming even in the highest pressure washers. It is non-toxic, has a high flash point, gives off no offensive odors, and is non corrosive. *The DuBois Company, Cincinnati 3, O.*

HEAT SEAL ACTIVATING MACHINE

PERVENACTOR is a machine to activate Nashua's delay action heat seal label paper, Pervenac. Activation is thermostatically controlled by means of a roll heater, which directs the heat into the precoated adhesive face of the label. The activator will handle a label up to a full 4″ in width. It is powered by a 1/70 hp, 110 volt a-c motor. The labels remain tacky for several minutes after passing through the machine. Labels can be applied to curved or several-sided surfaces, to tin, stainless steel, wet glass, and many surfaces to which water moistenable labels refuse to stick. *Nashua Gummed and Coated Paper Co., Nashua, N. H.*

WATER-PROOF PULLEY LAGGING

ALL-PURPOSE Condersite pulley lagging is waterproof, is quickly and easily applied without rivets, bolts, or heat, and dries within 10 hours at room temperature. It adheres so firmly to all surfaces that a hammer and chisel are required to remove it. It is weather and corrosion resistant, and is unaffected by sulphuric acid, oxidizing agents, alcohol, etc. Available in units consisting of 70″ x 40″ treated fabric and sufficient compound for application, cut to size for any pulley. *Condersite Engineering Corp., 2016 Chancellor St., Philadelphia 3, Pa.*

A-C MAGNETIC STARTERS

DESIGNED for starting and protecting motors up to 50 hp, these a-c magnetic starters are furnished in all NEMA sizes from 0 through 3. The contractors can be furnished in NEMA sizes from 00 through 3. Feature of the starter is a sturdy, one-piece plastic-encased coil enclosure which effectively protects the windings against dirt, moisture or possible damage during installation. The clamp-type coil terminals are firmly embedded in this enclosure to prevent loosening. Starters are furnished either open or mounted in general purpose, watertight, dust-tight, or hazardous atmosphere enclosures. Bulletins GEA-5153 and GEA-5154 available. *General Electric Co., Schenectady 5, N. Y.*

SIMPLIFIED LIQUID SOAP DISPENSER

NEW liquid soap dispenser does not have to be removed from the wall or returned to factory, since mechanism is completely demountable and replaceable without the use of any special tools, including a screw driver. Hood and working parts of mechanism are of stainless steel. Soap container, made of Lustrex, is shatterproof and translucent, and is impervious to all soaps. Concealed wall fastening guards against theft. Locked filler-cap is chained to the dispenser and can be opened only by special key. Known as the Bobrick 24. *Bobrick Mfg. Corp., 1214 Nostrand Ave., Brooklyn 25, N. Y.*

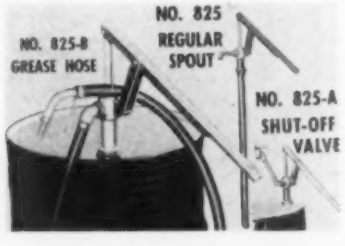
POWDER-ACTUATED HAND TOOL

SMALL, portable, powder-actuated driving tool will "pin" a pipe hangar to a concrete ceiling or wall, steel I-beam or column, in a few seconds. It also fastens wood to concrete or steel. It embeds studs in steel or masonry by the discharge of a blank cartridge, after which they have a holding power up to several thousands of pounds. Two diameters of studs, ⅜″ and ¼″ may be used by interchanging the barrels of the tool. *Mine Safety Appliance Co., 201 N. Braddock Ave., Pittsburgh, Pa.*

SELF-SEALING INTERIOR FINISH

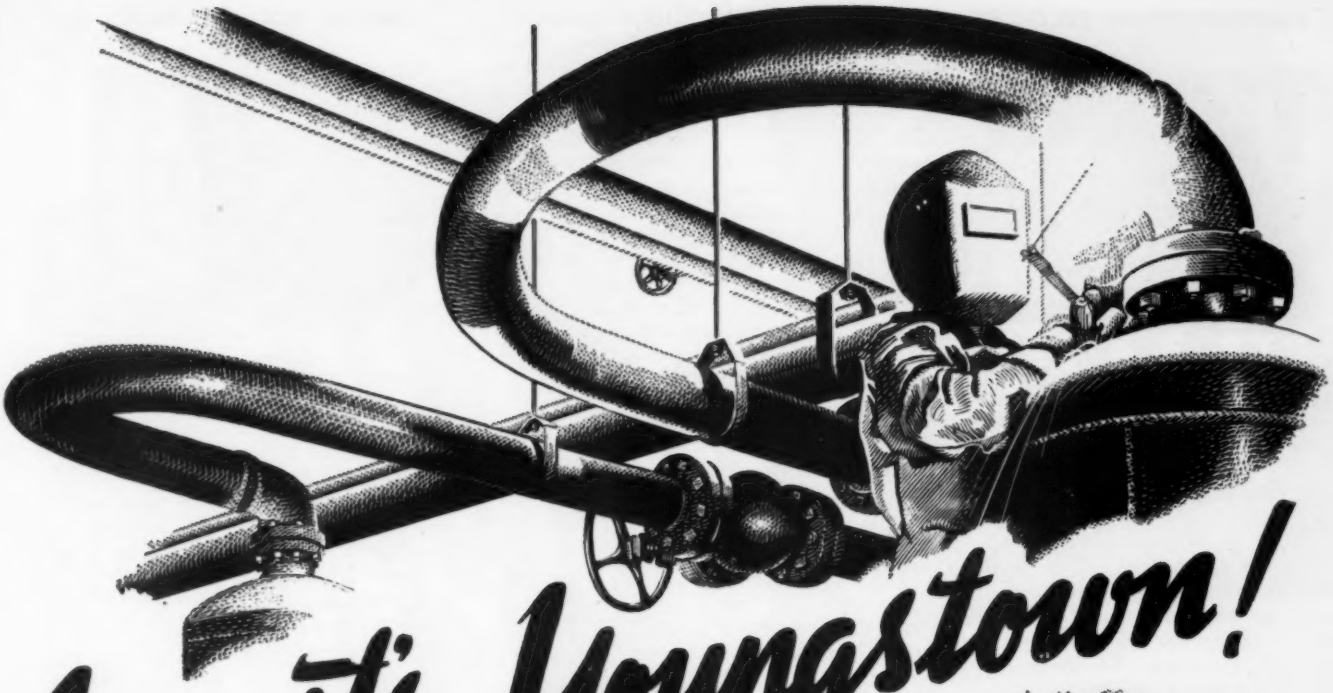
INTERIOR finish known as Hidex provides a sealer, undercoat and flat finish in one application. It is an oil-based paint that can be used over plaster, wall board, brick, cement, concrete, wood, metal, calcimine and wall paper. It can be applied by brush spray or roller and is free from objectionable paint odors. The paint bridges and seals air checks and hot spots, making it suitable for use over previously painted surfaces. *The Watson-Standard Co., 225 Galveston Ave., Pittsburgh, Pa.*

GENERAL PURPOSE PUMP



DRUM pump has a special spider design of the piston and intake opening that provides a cut-through action and large capacity that handles any fluid which seeks its own level, except lacquer thinners. Heavy greases are pumped at rates up to 3 gallons per minute. Higher rate for alcohol and other light fluids. Bung bushing fits both 2″ and 1½″ barrel openings on 15, 30 and 60 gallon drums. Model No. 825 is equipped with regular spout for general use; No. 825A with shut-off valve to eliminate losses by evaporation; 825B is equipped with 8′ grease hose. *General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.*

(*Please turn to page* 152)



Yes, it's Youngstown!

Dependable Steel Pipe ...Easy to Install

THROUGH the years, the guiding principle at Youngstown has been to make quality steel pipe which is well suited to serve the needs of plumbing and heating contractors and their customers. That's why Youngstown Pipe bends accurately, cuts readily, threads surely, welds easily--properties designed into the product for efficient fabrication, installation and long, satisfactory service.

Youngstown

STEEL PIPE

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

General Offices Youngstown 1, Ohio

Export Office - 500 Fifth Avenue, New York

PIPE AND TUBULAR PRODUCTS - CONDUIT - BARS - RODS - COLD FINISHED CARBON AND ALLOY BARS - SHEETS - PLATES - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES.

RUNNING COUNT RECORDER

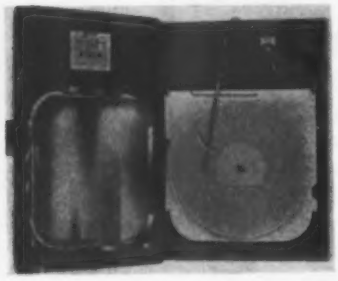


ILLUSTRATION shows instrument known as the Running-Count Recorder which plots on a circular chart a curve of number of operations against time. It records the total count of intermittent operations and the time at which each one occurs, and is used on production machinery to record work-producing operations or number of pieces produced. Total number of operations or pieces produced can be easily found. The hourly rate of production can also be easily read from the chart. *The Bristol Company, Waterbury 91, Conn.*

DRESSING REVITALIZES LEATHER BELTS

BELTLUBE is the name of a new dressing that is said to revitalize leather belts by lubricating interwoven fibres of the leather. It has a 100% neatsfoot oil base with other ingredients added to promote quick penetration, give better gripping surface and lengthen the life of the belt. Will not cake or gum on the belt surface. Can also be used for rubber or canvas belting. Available in 1 qt., 1 gal. and 5 gal. cans and 50 gal. drums. *Alexander Brothers, 406 North Third St., Philadelphia 23, Pa.*

RECESSING TOOLS

RECESSO-MATIC recessing tools, for use on multiple-spindle automatics, can be attached quickly, and for actuation utilize a telescoping draw-bar which connects to back of machine. They are said to be suitable for production operations requiring fast set-up, repetitive accuracy, maximum capacity, accessibility, simplified maintenance and maximum stroke. Models 1½ DB, 2-DB, and 3-DB have maximum capacities of 2", 3" and 4" respectively. Recessing stroke ranges from 9/32" on smallest tool to ½" on largest in line. *The Maxwell Company, 600 Broadway, Bedford, O.*

SELF BONDING ELECTRICAL INSULATING TAPE

WHEN applied under normal wrapping tension such as in splicing electrical connections, Bi-Seal, a new insulating tape, coheres to itself and other insulations to produce a permanent insulating jacket. A blend of synthetic polymers and resins, it is compatible with butyl rubber, polyethylene and vinyl resins. Its dielectric strength is better than 1,000 volts. Available in 1 lb. rolls of any desired width. One standard thickness, .020". *Bishop Gutta Percha Co., 420 East 25th St., New York 10, N. Y.*

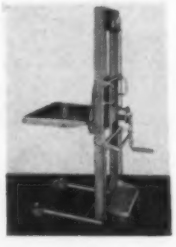
SLITTING SHEAR

PORTABLE slitting shear has a slitting capacity of ⅛" in mild steel and 10 gauge in stainless. An adjustable shoe, which provides additional support at the toe of the upper blade holder, is said to give increased strength and cutting efficiency. Heavy frame is used to give rigidity and strength. Powerful toggle action of upper blade holder makes for easy operation. Blades are interchangeable and adjustable. *The Beverly Shear Mfg. Co., 3001 W. 111th St., Chicago 43, Ill.*

TWO-CHANNEL INSPECTION GAGE

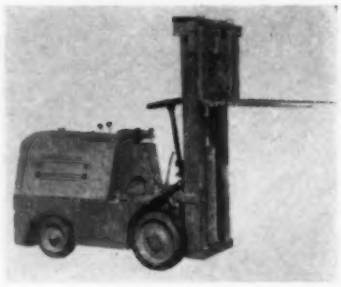
INDUCTION type measuring heads of a new two-channel inspection of two diameters operate without friction, and are provided with .025" range of fine adjustment for ease in setups to various sizes and fast corrections for wear. Each head is independently adjustable. Zero-setting is done to Masters. The amplifier operates on 110 volts, 60 cycles and is voltage regulated from 95 to 125 volts. *Graham-Mintel Instrument Co., 2443 Prospect Ave., Cleveland 15, O.*

LIGHTWEIGHT STACKER



HANDY Hoister is a light, rugged stacker said to be best utilized in lifting loads to working height for convenient reach of the workman, and in transferring or carrying materials to or from bench, press, or other machine. Among many other uses is the raising or lowering of loads from highway trucks. Crank-up-crank-down operation through planetary gear drive winch permits placing and holding platform at any level. Stocked in standard size of 500-lb. capacity. *Lewis-Shepard Products, Inc., 279 Walnut St., Watertown 72, Mass.*

5000-LB. FORK LIFT TRUCK

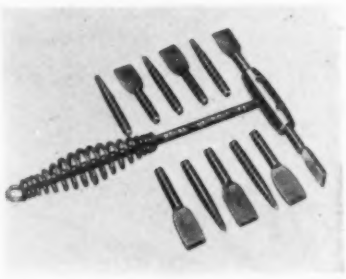


MODEL F50 Shop Mulift fork lift truck features unobstructed vision when traveling with load and a free lift of 55" with an overall height of only 83". The 5000 lb. capacity truck is rated at 20" from the heel of the forks and has a telescoping lift of 110". Dimensions: overall width 40"; overall length less forks 85"; overall height with forks down 83"; outside turning radius 88". Bulletin 548FT available. *W. F. Hebard & Co., 336 W. 37th St., Chicago 9, Ill.*

DURABLE, FAST-DRYING TRAFFIC PAINT

TRAFFIC paint based on Pentalyn 802A, a synthetic resin, and Parlon, chlorinated rubber, is said to be outstanding in durability and rapid dry. Test cross lines laid down on a busy highway intersection are claimed to have shown little signs of wear after more than two months of service. Drying speeds of the paint vary from 11 minutes to 20 minutes depending on such factors as thickness of film and type of solvent. When applied with conventional type traffic-marking equipment on asphalt surfaces, the paint does not cause bleeding. *Hercules Powder Co., Wilmington, Del.*

CHIPPING TOOL WITH REPLACEABLE BITS



"RE-BIT" is the name of this new weld chipping hammer that has replaceable bits. No balls, springs, screws or clamps are used. A simple taper locks both bits securely in the head in any position. Design of blades is said to provide good visibility, long life, easy access to tight spots and a wide chipping range. Available in 12 oz. and 16 oz. weights, with a choice of Flex-o-Steel or wood handles. *Atlas Welding Accessories Co., 707 East Lewiston, Detroit 20, Mich.*

(*Please turn to page* 154)

Want to CUT COSTS? See EX-CELL-O

EX-CELL-O Special Machine Combines Operations to Save Handling...Save Man Hours...Save Space

This Ex-Cell-O Special Machine for turning the tapered ellipse on automotive pistons does a complicated machining job while still maintaining a high rate of production and fine finish. Ex-Cell-O used as a basis for this operation a standard Style 61 Precision Cylinder Boring Machine. Production is 180 pieces per hour net. The engineering "know-how" that makes a job like this possible is available to you through Ex-Cell-O. Write Ex-Cell-O in Detroit today! 49-8

EX-CELL-O CORPORATION DETROIT 32

Special Multiple Way-Type Precision Boring Machines • Special Multiple Precision Drilling Machines • Precision Boring, Turning, and Facing Machines and Fixtures • Precision Cylinder Boring Machines • Precision Thread Grinding Machines • Precision Lapping Machines • Precision Broach Sharpening Machines • Other Special Purpose Machines • Tool Grinders • Continental Cutting Tools • Broaches and Broach Fixtures • Counterbore Sets • Grinding Spindles Hydraulic Power Units • Drill Jig Bushings • R.R. Pins and Bushings • Fuel Injection Equipment • Dairy Equipment • Aircraft and Miscellaneous Production Parts

Speed Sweep

THE BRUSH WITH THE STEEL BACK

Sweeps cleaner, faster — Outlasts ordinary brushes 3 to 1!

Speed Sweep brushes have a steel back which is the basis of unique design for faster, easier, better sweeping. Block is ⅓ usual size for easier handling. Tufts are longer and more compact, providing "spring and snap" action. Handle is instantly adjustable to height of sweeper—reduces fatigue and strain. Speed Sweep brushes are sturdy—they contain highest grade materials and are constructed for long life. Speed Sweep brushes have been proved by so many firms and under such varying conditions that they are unconditionally guaranteed to meet your needs. Mail coupon today for complete information about sizes, styles and prices.

MILWAUKEE DUSTLESS BRUSH CO.
530 North 22nd St., Milwaukee 3, Wisconsin

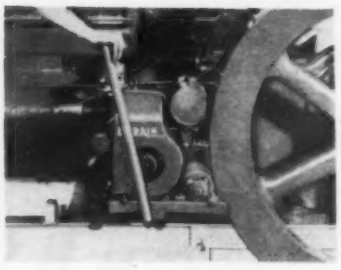
Please send complete information about Speed Sweep Brushes

Name_____

Street Address_____

City, State_____

FRICTION-DRIVE STARTER

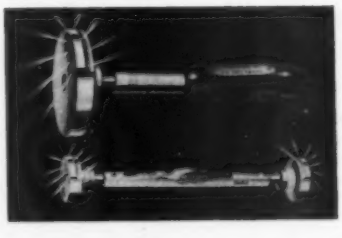


SELF-POWERED friction-drive starter for diesel or gas engines can be used on any horizontal or vertical type engine having an exposed flywheel. It is powered by an air-cooled, single-cylinder gasoline engine with 4 brake hp output. Gasoline engine drives a plastic composition friction pulley through a chain and sprocket reduction gearing system. *White-Roth Machine Corp., Lorain, O.*

BRONZE GLOBE VALVE

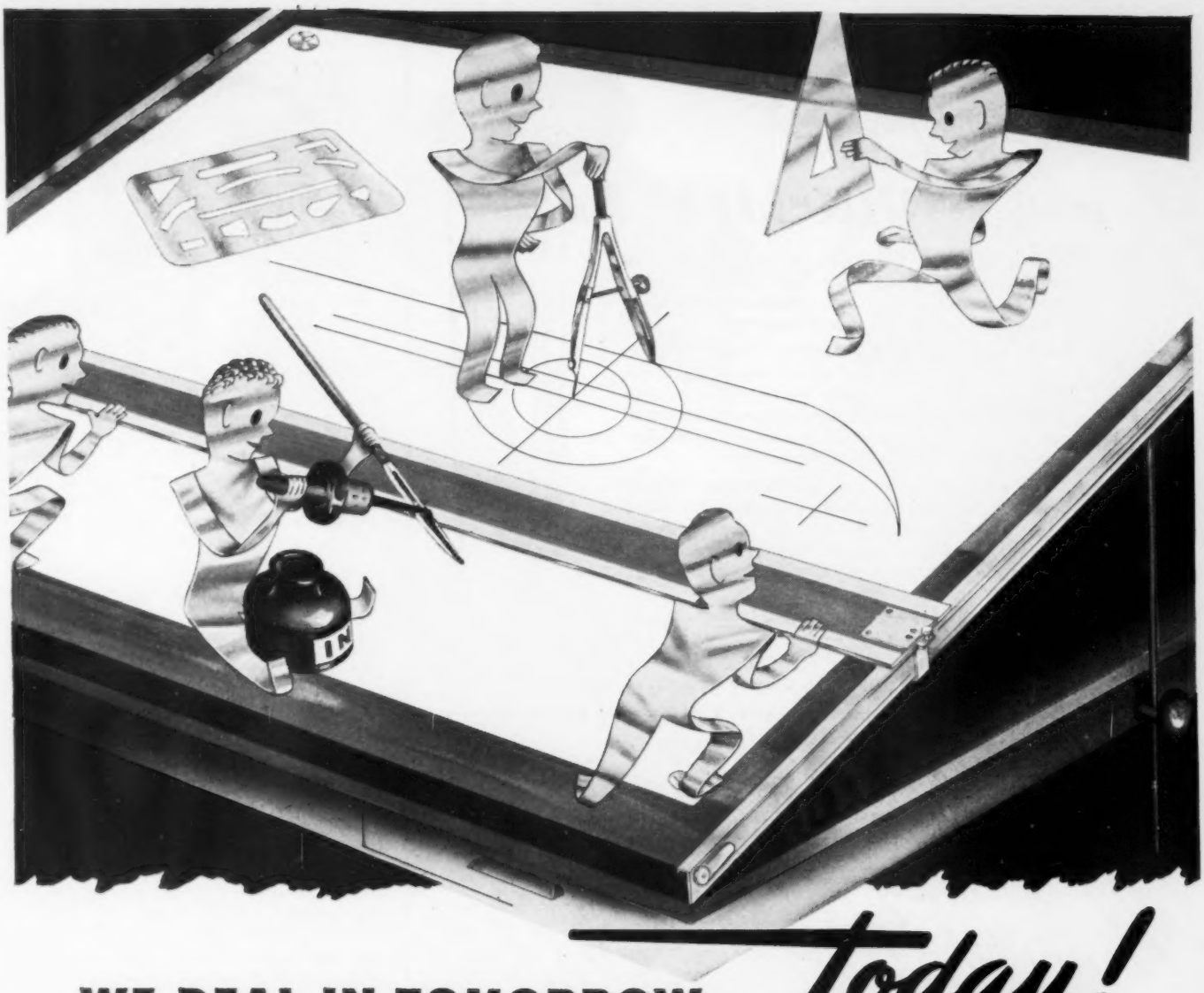
FIG. 976-A is a new plug type bronze globe valve for 300 lb. service. It is especially suited to serve services such as pressure regulation, steam control by-pass lines, temperature regulation, apparatus throttling, bleeds, drips and drains, soot blowers, continuous blow downs, etc. The valve features the "armor seat" and slip-on, stay-on plug. Plug and seat ring of JX500, special alloy stainless steel, make a combination which is described as practically impervious to wear. Folder, Form 193, available. *Jenkins Bros., 80 White St., New York, N. Y.*

CHROMIUM PLATED PLUG GAGES



DUBO plug gages with hard chrome plating on the gaging surfaces are said to be especially suitable for long runs and for checking the more abrasive materials, such as aluminum castings. A DuBo member is entered with its spherical gaging surfaces out of range of the bore walls and following the entry the gaging surfaces are rocked into contact, or potential contact, with the inside of the bore. Much of the wearing, frictional action common to cylindrical plugs is therefore avoided. *Standard Gage Co., Inc., Poughkeepsie, N. Y.*

(*Please turn to page* 156)



WE DEAL IN TOMORROW . . . *Today!*

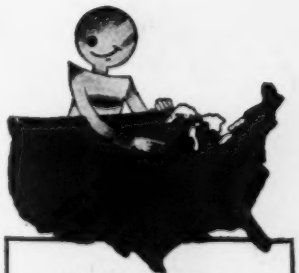
The ingots of raw aluminum feeding into our rolling mills today will become important components of tomorrow's finished products. To satisfy the varied industries which we serve, our work in design, in alloy, and in finish must always be months ahead of "today's" most modern advancement.

In the 51 years that we have worked with aluminum, we have come to know intimately its wealth of application. For more than half a century we have equipped ourselves and trained our men to handle aluminum swiftly, effectively, and economically.

This knowledge and equipment, plus the developed skill of the "metal men of Manitowoc," is at your command. Use it today, for *your* tomorrow.

A CONTRACT PLACED WITH US EXPANDS *YOUR* PLANT TO INCLUDE:

- Machine Shop and Die-Making Facilities
- Four Large Fabricating Plants
- Spacious Aluminum Rolling Mills
- Wide Range of Stamping Presses
- Heat-Treating Equipment
- Gas and Electric Welding
- Complete Finishing Equipment



ALSO MAKERS OF
MIRRO
The Finest Aluminum Cooking Utensils

CONTRACT, AUTOMOTIVE AND AVIATION DIVISIONS

ALUMINUM GOODS *Manufacturing Company*

MANITOWOC WISCONSIN

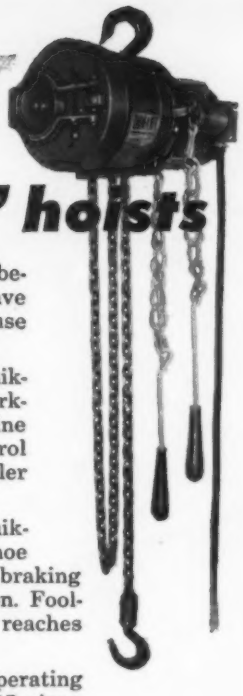
FIFTH AVENUE BLDG., NEW YORK 10 MERCHANDISE MART, CHICAGO 54

Want Additional Product Information? See Page 19.

YOU CUT COSTS

4 WAYS

with "QUIK-LIFT" hoists



1. **"Quik-Lifts" Cost You Less** per year to own because they are better built, last longer . . . save on both maintenance and replacement because of heavy-duty construction throughout.
2. **Save You Money by Saving Time.** "Quik-Lifts" eliminate time and effort wasted by workers operating hand hoists — cut idle machine time, speed production. Double-pendant control is convenient, accurate. Sensitive controller permits moving load fraction of inch.
3. **Protect You from Loss or Damage.** "Quik-Lifts" are tested to over rated capacity. Shoe type brake cannot slip or drop load. Large braking surface assures smooth, positive operation. Foolproof switch stops hoist when load hook reaches upper or lower limit.
4. **Exact Model for Your Job** assures top operating efficiency. "Quik-Lifts" are available in 17 sizes, 500 to 4000 lb.—lifting speeds 4 to 49 ft. per min.—hook or lug suspension—with or without trolley.

● *Write for illustrated folder* ZE-5 *giving complete information*

COFFING HOIST Company

Danville, Illinois

HOIST-JACKS, SAFETY-PULL RATCHET LEVER HOISTS, SPUR-GEARED HOISTS, "MIGHTY MIDGET" PULLERS, LOAD BINDERS, TROLLEYS

Halsey Taylor

It's the line ... for '49

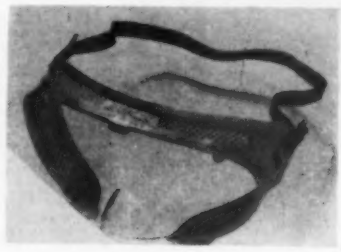
in coolers and fountains

In every plant workers need the refreshing stimulation of a constant supply of cool water. And in every instant Halsey Taylor Coolers help provide abundant water and vital protection against contamination too! Cooler and fountain combinations or separate coolers for use with fountains strategically placed in office or shop. *Ask for literature.*

The Halsey W. Taylor Co.
Warren, O.

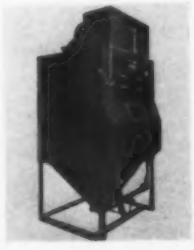
F-1

PLASTIC EYE GOGGLES



EYE protection in woodworking, grinding, spot welding, and similar light-duty operations, is offered by MonoGoggles, made of a one-piece plastic lens, in either flat or curved styles. The MonoGoggle is said to provide clear vision and ample eye protection, light weight, excellent impact resistance, and low heat transmission of the lens, which retards fogging. Lenses come in either clear or green acetate and are replaceable. *Willson Products, Inc., Reading, Pa.*

METAL CLEANING MACHINE



"JET BLAST" machine for wet abrasive blast cleaning and finishing of metal surfaces removes rust, scale and undesirable metal particles, such as feather edges on sharpened tools, by projecting a slurry of fine abrasive suspended in water against the surface to be cleaned. Specifications of standard models are: 30" x 30" cabinet, 77" high, one blast nozzle and exhaust blower directly connected to ¼ hp motor; and 48" x 42" cabinet, 108" high, one to eight blast nozzles and exhaust blower directly connected to 1 hp motor. *Armstrong Chemical and Machine Co., Painesville, O.*

ALL STEEL TRAILER

WHEEL-O-MATIC all-steel-constructed trailer features a double hitch that facilitates easy parking and prevents jackknifing; and a floatingwheel assembly that is said to eliminate wheel shimmy and assure load level at all times. Road tests show the trailer able to carry 1,000 lb. load at speeds up to 65 mph without evidence of swing or sway, maker states. Body measures 60" long, 42" wide and 12" deep. It has 4 corner posts for rack body or canopy top. *Sedgwick Machine Works, Poughkeepsie, N. Y.*

(Please turn to page 158)

Speed AND *Accuracy* IN EVERY BLOW

Plumb tools do the job faster. They're made that way, made to deliver full force with every blow. Balanced to hit hard and accurate.

Beneath the surface of Plumb tools are the reasons for Plumb Quality. For instance, Plumb Nail Hammers have four separate points of hardness. The head is hardened to withstand pounding—the body or eye is toughened to absorb shock—the claws are spring tempered to withstand strain—the split in the claw is tempered to bite into nails and grip tightly. The handles made from strength-tested hickory are shaped for comfortable grip to lessen fatigue. These exclusive Plumb features mean more sales and better performance. Fayette R. Plumb, Inc., Philadelphia 37, Pa.

The black head and the red handle —exclusively Plumb

Quality Comes FIRST

PLUMB

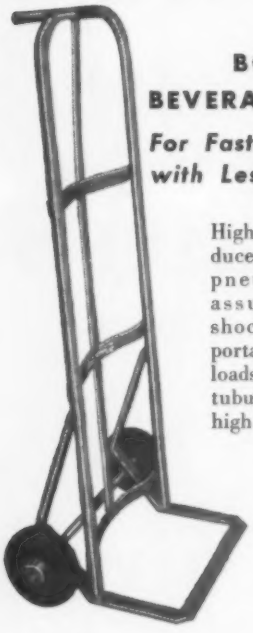
is FIRST in Quality

PLUMB

HAMMERS • HATCHETS • AXES • FILES

Bond
REG. U. S. PAT. OFF.

Shortcuts to Speedy, Easy Handling



BOND BEVERAGE TRUCK

For Faster Handling with Less Footwork

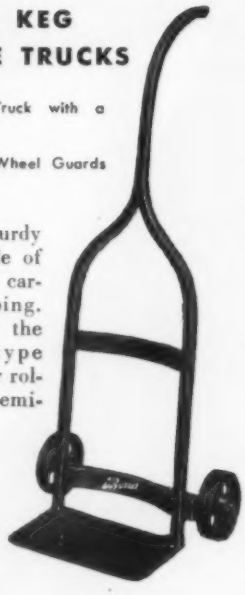
High capacity reduces legwork. Semi-pneumatic tires assure smooth, shockproof transportation for fragile loads. Full welded tubular steel, 49" high; nose 14" wide by 7½" deep. Light—weighs only 29 lbs. Equipped with stair glides.

BOND KEG AND CASE TRUCKS

No. 4691—The Truck with a Thousand Uses.

No. 4962—With Wheel Guards for Handling Bags.

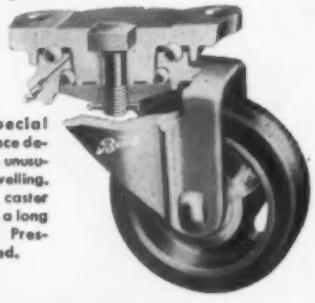
This pair of sturdy trucks are made of 1" square high carbon steel tubing. Available with the following type wheels: plain or roller bearing semi-steel; plain or roller bearing vulcanized-on rubber.



BOND TRUCK CASTERS

Save Time at Every Turn

You will find the caster that's exactly right for your particular plant conditions in the complete Bond line. There's a Bond *built-for-the-job* caster for every industrial use.



36-A. Special double ball race design provides unusually easy swivelling. Sturdy Bond caster metal assures a long service life. Pressure lubricated.

40-A. All Steel Caster. A practically indestructible caster for heavy duty. Swivels with frictionless ease on hardened ball races. Pressure lubricated.

BOND UNIVERSAL LIFT JACK

The Jack for All Trades

Simplifies handling of light and heavy loads. Couples and uncouples quickly, turns easily. Handle adjusts to operator's height. Operates in close quarters with handle in vertical position.

●

Send for free folders describing the advantages of Bond hand trucks, casters and lift jack.

Bond Foundry & Machine Co., Manheim, Pa.

"PUSH PULL" RULES

NOS. 346 and 348 "Push Pull" Rules feature: die cast "D" shaped case—add 2" for inside measurement; triple plated finish—chrome over nickel over copper; patented nickel plated or white baked enamel blades; vertical marking; quick change blade feature with positive fastening. Blades are rigid steel for measuring straight distances in any position, and flexible for circumferences and irregular shapes. Available in 6' and 8' lengths. *Stanley Tools, New Britain, Conn.*

LIGHTWEIGHT WELDER

ENGINE-driven, d-c welder weighs only 660 lbs. for a maximum of 250 amperes of welding current. It can be easily transported on a pick-up truck, leaving ample truck capacity for other equipment. It is powered by a Wisconsin VF-4 air-cooled engine, speed-ratio-coupled by a steel-core V-belt drive to a G-E type WD-3200 generator with 50% duty cycle. Fully calibrated dual control permits accurate setting of a desired welding current before the arc is struck. Bulletin GEA-4886 available. *General Electric Co., Schenectady 5, N. Y.*

LOCALIZES COOLANT, OIL AND AIR

LOCALUBE is a unit for use on small drill presses, milling machines, saws, etc. which do not have built-in coolant or oil pumps. It becomes a part of each machine that may use coolant, oil or air. It may be adjusted out of the way when running dry jobs, and can be made available when wet operations are desired. By the use of two units, the combination of punches and dies by atomizing the oil with the air. *Fostoria Pressed Steel Corp., Fostoria, O.*

(*Please turn to page* 160)

Skillful Molding

MEANS TUNEFUL PERFORMANCE

Cobra Tone Arm, molded for Zenith Radio Corp. Chicago

Yes, skillfully molded plastic parts do help the flow of beautiful melody in any music reproducing instrument. A striking example is this Cobra Tone Arm which we molded for the Zenith Radio Corporation. We were commissioned to mold a piece that would help to serve in bringing new vibrance and tonal color to phonograph record performance. From the careful selection of the *most suitable* plastic material through the precision molding, we had music on our minds. The amazing musical success of the Cobra Tone Arm proved we worked in the right key. We can work equally well in tune with your production aims. Let our engineers help you today.

Write on your letterhead for the new Injection Molded and Extruded Plastics Catalog. Or, for detailed information about •MILLS-PLASTIC®, piping, tubing and fittings, write for circulars containing data and illustrations.

NEW PLANT

NEW ADDRESS

ELMER E. MILLS CORPORATION

INJECTION MOLDERS and EXTRUDERS of: Tenite, Lumarith, Plastacele, Fibestos, Lucite, Plexiglas, Nylon, Polystyrene, Styron, Lustron, Loalin, Vinylite, Geon, Plexene, Polyethylene, Cerex, Forticel, •MILLS-PLASTIC®, Saran, and other Thermoplastic Materials

2930 NORTH ASHLAND AVENUE • CHICAGO 13, ILLINOIS

"... we insist that only highest quality products be used in our manufacturing process, even to the labeling"

PIONEERING *in the making of* ADHESIVES THAT WORK

"To maintain Skippy as America's largest selling brand of Peanut Butter we insist that only highest quality products be used in our manufacturing process, even to the labeling. Arabol provides our plant in Alameda with labeling adhesive, because of its proven superiority"—Rosefield Packing Co., Ltd. Arabol is proud to furnish Rosefield Packing Co. with labeling gum because of their insistence upon top quality adhesive for their labels. The Skippy label must be there, neat and secure. Out of more than 60 years service to the leaders in a hundred industries, there are now some 10,000 adhesives formulas on file in the three Arabol Laboratories. See the Arabol Representative when he calls; he knows adhesives.

THE ARABOL MANUFACTURING CO.

Executive Offices: 110 East 42nd St., New York 17, N. Y.
CHICAGO 50—1835 S. 54th Ave. • SAN FRANCISCO 3—1950 16th St.
LOS ANGELES 11—2262 E. 37th St. • ATLANTA 3—375-377 Whitehall St., S. W.
BOSTON 9—12 Commercial Wharf • PHILADELPHIA 47—600 S. Delaware Ave.
ST. LOUIS 4—2500 Texas Ave. • PORTLAND 9, ORE.—1233 N.W. 12th Ave.
LONDON E. C. 1—8 Sans Walk, Clerkenwell

Adhesives?... ARABOL!

COIL SPRING LOAD TESTER

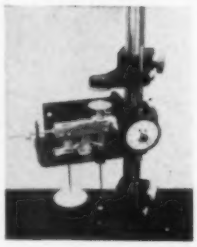
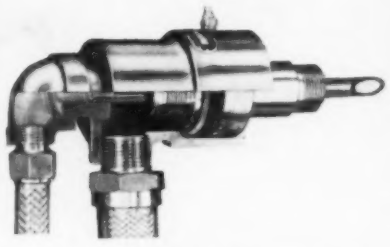


ILLUSTRATION shows Model 217P load tester for manufacturers and users of small coil springs. The machine will test 50 to 200 springs with an accuracy of one part in 2,500 at maximum load, and do it in from 15 minutes to an hour. It will handle loads of up to 5 lbs., and spring lengths up to 12". It is equally adapted to the go-no-go or the frequency distribution techniques of statistical inspection. Because of machine design a minimum of motions is required of the operator. *Hunter Pressed Steel Co., Lansdale, Pa.*

ROTARY JOINT



TYPE "S" (syphon) rotary joint can be used on temperatures up to 600° and pressures up to 150 lbs., providing inlet flow of steam to rotating cylinders such as a drum of a process drying machine, and outlet of condensate. Type "P" (plain) provides one passage only, and is installed at each end of a revolving drum. Manufactured in 8 pipe sizes, ½" through 3". Furnished with flexible bronze hose for steam and high pressure applications, or with rubber hose for water or coolants. *Perfecting Service Co., 6140 Cottage Grove Ave., Chicago 37, Ill.*

TILTING-HEAD HYDRAULIC PRESS

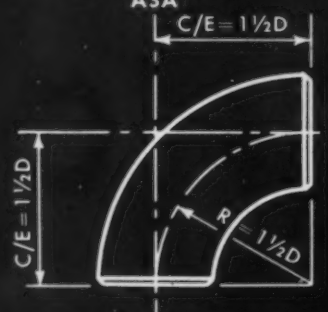
ILLUSTRATION shows Merit press Model No. E-113, available in two sizes having platens of either 14" x 14" or 24" x 24". They are designed for applications requiring high - speed operation, accuracy of mold register, convenience of loading, and ease of stripping molded products from press. Operating speed is 3 seconds, including opening or closing of mold and tilting of head. Small press is stressed for a maximum pressure of 3000 psi (124 ton maximum) and large press for pressure of 2500 psi (284 ton maximum). *Emmett Machine & Mfg., Inc., 2249-18 Fourteenth St., Akron 14, O.*

(*Please turn to page* 164)

Improvements and economies in welded piping result from this *Variety* of

MIDWEST ELBOWS

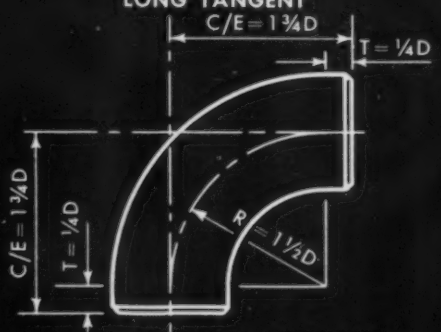
1
LONG RADIUS ASA



SIZES: ¾" TO 24", INCLUSIVE

Dimensions conform to applicable size range of American Standard for Butt-Welding Fittings, ASA B16.9. Radius and center-to-end dimension equal 1½ times nominal pipe size.

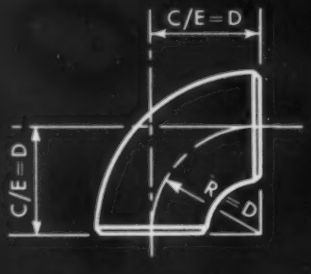
2
LONG RADIUS LONG TANGENT



SIZES: 2" TO 20", INCLUSIVE

Same radius as ASA Elbows but with long integral tangent on each end — an exclusive Midwest feature that saves time and pipe. No price increase over ASA Elbows.

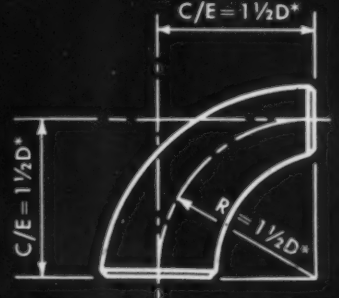
3
SHORT RADIUS



SIZES: 1" TO 30", INCLUSIVE

Where space limitations prevent use of ASA Elbows or Midwest "Long Tangent" Elbows shown above at right, these short turn elbows without tangents are recommended.

4
LONG RADIUS REDUCING



SIZES: 2" TO 12"*, INCLUSIVE

Midwest Reducing Elbow takes the place of a straight elbow and a reducer. It saves more than one-third of the welding and improves both design and appearance.

SYMBOLS { *C/E—Center-to-End Dimension* / *T—Length of Tangent* }

D—Nominal Pipe Size *R—Radius*
**D—Dimension is for larger Pipe Size*

The *variety* of Midwest Welding Elbows is particularly important because of the exceptional latitude in design and economy in erection that it provides. For example, the Midwest Long Tangent Elbow permits faster, easier, more accurate lining up with pipe . . . removes weld from point of maximum bending stress . . . often eliminates a short nipple and its extra weld. Slip-on flanges are easily used with minimum change in flange and fitting.

This "Variety" is only one of several reasons why many users prefer Midwest Welding Elbows.

Only MIDWEST offers this VARIETY

MIDWEST WELDING FITTINGS

Improve Piping Designs and Reduce Costs

90° ELBOWS

REDUCING 90° ELBOWS

45° ELBOWS

LAP-JOINT STUB ENDS

REDUCERS

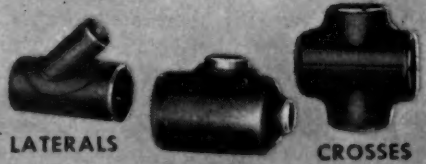
CAPS

SADDLES

SLEEVES

RETURN BENDS

TEES



LATERALS

CROSSES

REDUCING-ON-RUN TEES

SHAPED NIPPLES

FLANGES

MIDWEST PIPING & SUPPLY CO., Inc.

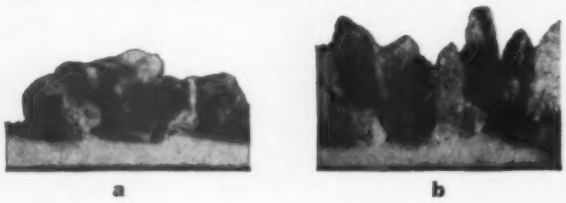
Main Offices: 1450 South Second Street, St. Louis (4), Mo.
***Sales Offices:* New York (7), 30 Church St.**

Chicago (3), 79 West Monroe St. • Los Angeles (33), 520 Anderson St. • Houston (2), 229 Shell Bldg. • Tulsa (3), 533 Mayo Bldg. South Boston (27), 426 First St. • Distributors in Principal Cities.

FOR GRINDING, POLISHING AND FINISHING

—The Backstand-Belt Method has these five advantages...

The coated abrasive belt used in conjunction with contact wheel and backstand idler has been established as an efficient production tool. For grinding, polishing and finishing hundreds of consumer and industrial items, the backstand-belt method is more efficient and economical than the older set-up wheel method—because the backstand-belt has these five advantages over the set-up wheel . . .



a b

1. An abrasive belt is a scientifically made tool, manufactured under controlled atmospheric conditions by experts utilizing modern making equipment. The photomicrographs compare the crude, uncontrollable rolled-on cutting surface of (A) a typical set-up wheel with (B) the coating on an Armour Abrasive Belt. Note how the sharp cutting points on the factory coated belt are exposed to provide faster, cleaner cutting action . . . increased production.
2. The coated abrasive belt cuts cooler because of the longer interval between work contacts.
3. Inexperienced help can be quickly trained to operate a backstand-belt machine. Highly skilled personnel needed to dress the wheels can be used elsewhere.
4. It takes only a few seconds to change an abrasive belt.
5. Temperature-controlled room for curing set-up wheels can be released for other more productive uses.

Actually, there are more than five advantages to the backstand-belt method. If you are now using set-up wheels for your grinding, polishing and finishing operations, it will pay you to investigate this modern method. The coupon below is for your convenience in requesting the additional information contained in our new booklet—"Facts about Backstand-Belt Grinding and Polishing."

MAIL THIS COUPON TODAY

Please send me the booklet.
"Facts about Backstand-Belt Grinding and Polishing"

*Name*_____ *Title*_____

*Firm*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

Typical example—polishing and deburring time on stamped out surfaces improved 40%.

The McCaskey Register Company of Alliance, Ohio, a leading manufacturer of bookkeeping equipment, formerly used set-up wheels for polishing and deburring stamped out register covers. By switching to the backstand-belt method, production time for this operation was cut from one hour and 15 minutes per unit to 45 minutes per unit.

CASE HISTORY

This is a splendid example of what the backstand-belt method can do for you regardless of whether you are grinding, polishing or finishing flat or contoured surfaces, cast stamped or forged pieces.

PART. Cash register cases with fitted top cover.

MATERIAL. 18 gauge steel on cases, 20 gauge steel on covers. Both are deep draw stampings. They are given 3 draws and 2 anneals before polishing. The anneal is scale free as a result of being treated in a special atmospheric furnace.

PROBLEM. Polish flat surfaces after stamping and annealing. Debur fins resulting from stamped out portions of cases and covers.

PREVIOUS METHOD. Set-up wheels—grits 36, 60 and 100. Production with this method was 1 hour and 15 minutes for one case and cover.

SOLUTION. A Porter-Cable backstand unit is used in conjunction with a 16" medium hard, segmented felt contact wheel. The abrasive belts used are a No. 50 Armourclad Heavy Duty Alundum Cloth 2" wide x 168" long and No. 100 Armourclad Alundum Cloth 2" wide x 168" long running at the rate of 7000 SFPM.

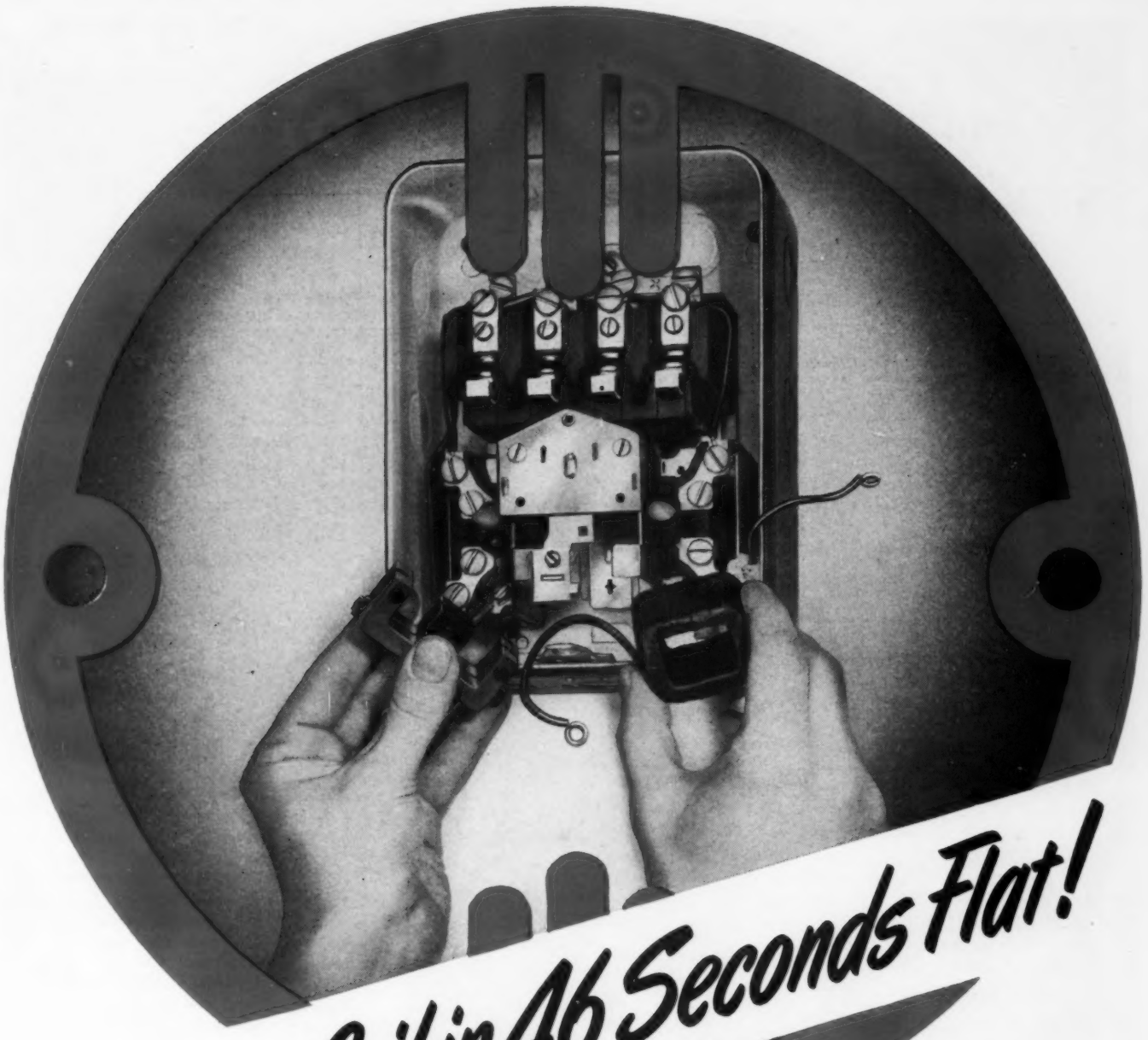
RESULTS. It now takes only 45 minutes to polish and debur one case and cover. Intermediate sanding operation eliminated. Storage problem greatly decreased.

We recommend buying through your Industrial Distributor.

ARMOUR *Coated Abrasives*

ARMOUR AND COMPANY

1355 W. 31ST STREET • CHICAGO 9, ILLINOIS



Change Coil in 46 Seconds Flat!

Change is FASTEST, EASIEST with Federal Noark Motor Starter

IT'S ALMOST "PRESTO, CHANGE!" replacing a coil in Federal Noark Motor Starters. Only three quick operations to get the old coil—three more, in reverse, to insert the new one. Federal design is the simplest, fastest on the market today. All parts readily accessible from the front. Saves time, effort and money.

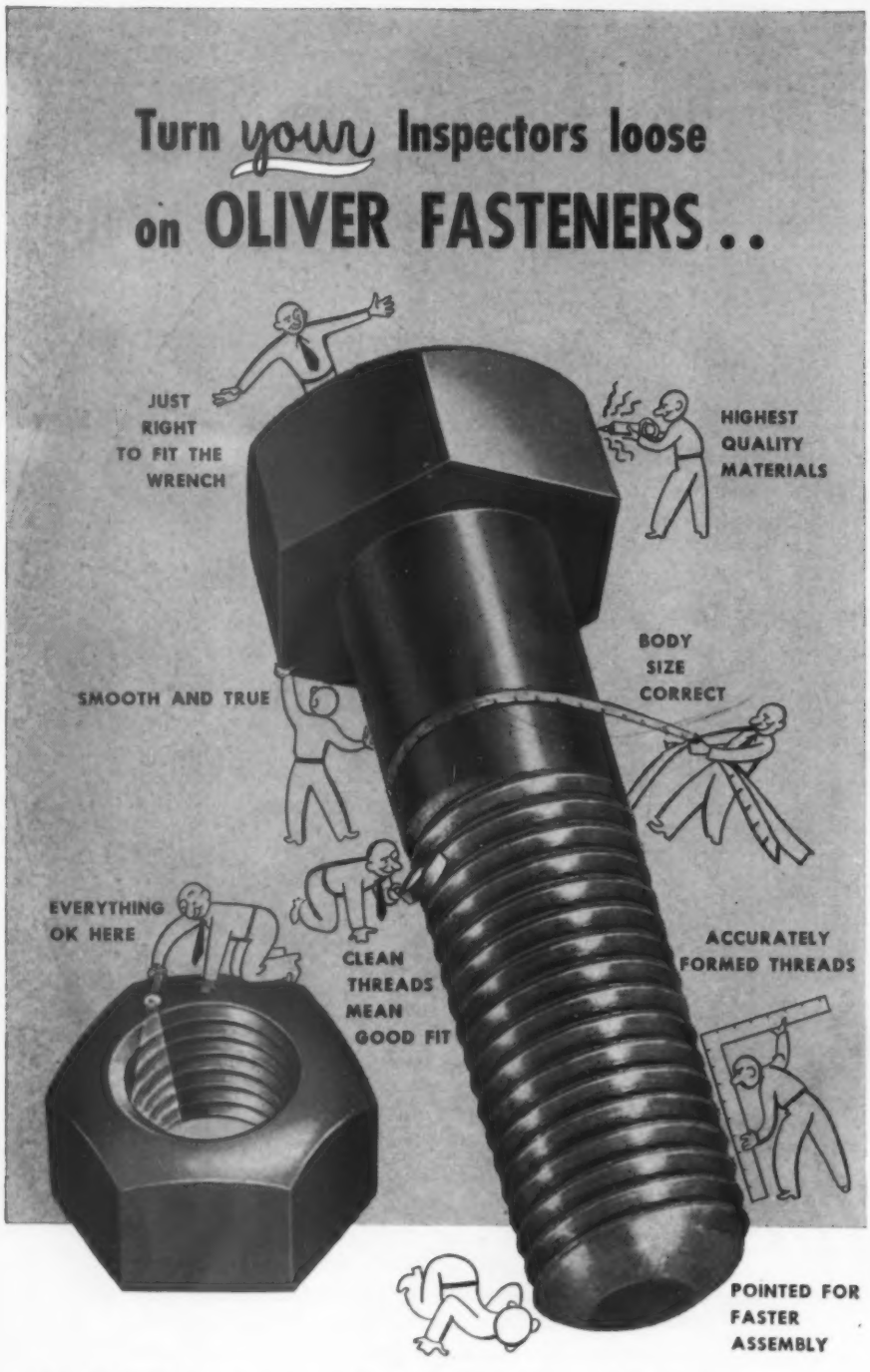
What's more, there's almost no chance for trouble in Federal Noark Motor Starters. There's only one moving unit and that *rides on ball bearings*—an exclusive Federal feature!... Important, too, Federal permits the choice of getting automatic or manual reset instantly... simply turn a knob and you've the type of overload protection that you want.

Order Federal Noark Motor Starters from your Federal Distributor. And write us for free copies of the "Federalog" and "Simplified Motor Control" giving full descriptions. Federal Electric Products Company, 50 Paris St., Newark 5, New Jersey.

FEDERAL NOARK

MOTOR STARTERS

Complete line of Federal Electric Products includes Motor Controls, Safety Switches, Service Equipment, Circuit Breakers, Panelboards, Switchboards, Bus Duct ★ Sales offices in principal cities.



OLIVER Fasteners meet your most rigid specifications. Made under modern manufacturing conditions by one of the oldest firms in the industry, Oliver combines experience with skill to produce bolts, nuts, rivets and cap screws of highest quality.

For guaranteed satisfaction, specify OLIVER!

SEE YOUR DISTRIBUTOR!

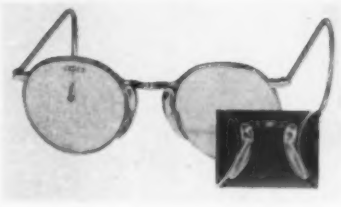
OLIVER
IRON AND STEEL
Corporation

South Tenth and Muriel Sts. · Pittsburgh 3, Pa.

BROKEN TOOL REMOVER

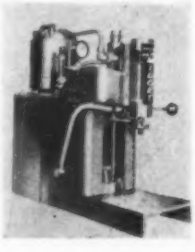
MODEL "X" broken tool, stud and pin remover is a low - priced lightweight, portable disintegrator that does not require heavy cabinets, controls and other equipment necessary for a permanent setup. It is designed to cover the needs of shops where taps, drills, reamers, studs and pins occasionally require moving, in sizes from .085" upward, and where the installation of capital equipment is not justified. The remover does not anneal the work; there is no distortion, electrolysis or mutilation of any kind, and the hole-wall or thread is not touched or damaged in any way. *Elox Corp., Clawson, Mich.*

SPECTACLE TYPE GOGGLES



COMFORT bridge that virtually "floats" the goggles in correct position features these spectacle goggles. Broad-bearing jumbo pads plus balanced suspension of frame distribute the light weight evenly across the nose, giving greater comfort. The pads also seal the entire eye area to prevent entrance of foreign particles. Unusual impact resistance and durability are claimed because of improved welding process used on frame. Available with 3 bridge widths and 3 lens sizes to provide correct fit for various facial contours. *Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill.*

LOW COST 2000-LB. PRESS



MIDGET Multipress is a low-priced multi - purpose, oil hydraulic press of 2,000 lbs. capacity. Ram stroke, ram speed and ram pressure are all easily regulated by controls at the operator's fingertips. The press can be switched rapidly from one job to another because of its versatile control and the ease with which tooling can be changed, maker states. It has a ram stroke of 6"; throat depth of 4⅝"; daylight opening of up to 15⅜". Measures 13" x 30" x 29¾" and weighs 270 lbs. *The Denison Engineering Co., 1160 Dublin Rd., Columbus 16, O.*

(*Please turn to page* 168)

Who can foretell . . . the far-reaching benefits new Oakite cleaning methods will bring to industry's purchasing agents tomorrow?

Every purchasing agent's basic function and responsibility is to find the right materials and the the right source of supply. On his judgment, skill and knowledge rest the buying decisions that determine costs . . . that insure a prompt and steady flow of materials to his company.

And what of the responsibility of selecting industrial cleaning materials . . . essential at one or more points in practically every production, processing or maintenance operation? Here a purchasing agent must be guided by a variety of considerations . . . his knowledge of the reputation and reliability of the supply source, the technical service and information it renders, the quality and uniformity of its products, price, promptness in shipments.

Over 33,000 purchasing agents today have found a successful answer to that problem. They specify Oakite cleaning materials, methods and technical service. It is a fact which speaks for itself. Certainly it may be accepted as your assurance that Oakite, as it has in the past 40 years, will spare neither time nor effort to continue to deserve such significant recognition in the future. Oakite Products, Inc., 21A Thames St., New York 6, N. Y.

Oakite Technical Service Representatives Are Located in All Principal Cities of the United States and Canada

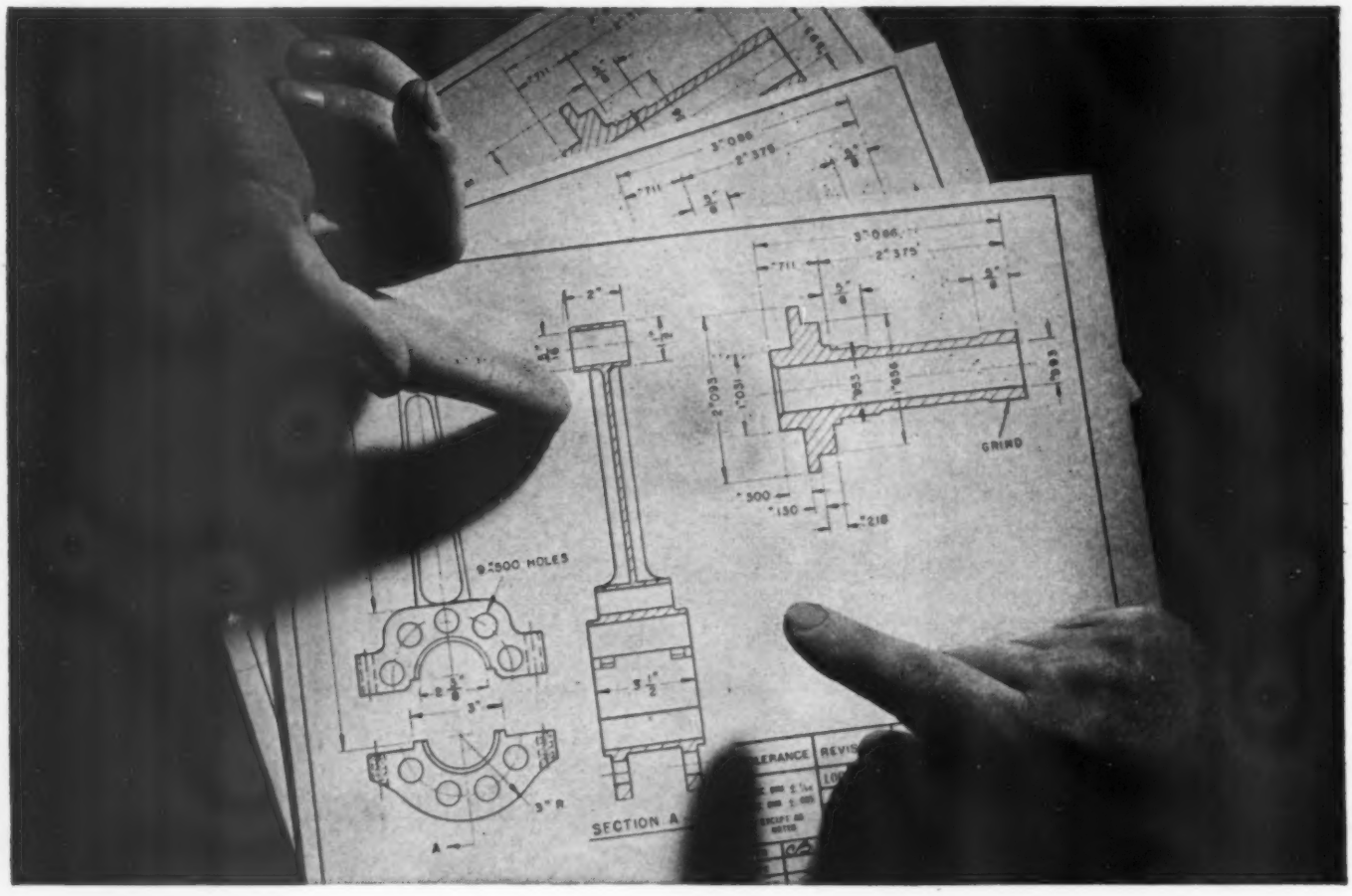
OAKITE
REG. U.S. PAT. OFF.
INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

Want Additional Product Information? See Page 19.

K+E

partners

For 81 years K & E equipment and materials have been



POSITIVE LINE PRINTS THAT ARE CONSISTENT

When you make positive line, dry developed prints, you need consistent results from dependable materials. That is our constant goal in the manufacture of the HELIOS* line of papers, cloths and films.

To be sure of absolute K&E standards in the color-forming components required for these dry diazo products, we established a new plant where we manufacture HELIOS materials exclusively. We not only control and make the finished materials, but actually manufacture, from the raw materials, the image-forming chemical components as well. Thus HELIOS papers, cloths and films are the direct product of 81 years of K&E experience and K&E insistence on quality first.

HELIOS dry developed materials cover a wide field of reproduction needs. They consist of opaque papers (black, blue and maroon line) and opaque cloth for working prints, besides transparent papers and cloth and clear and matte films, for intermediate originals (to use instead of originals).

in creating . . .

partners of the engineer, the scientist and the draftsman in shaping the modern world.

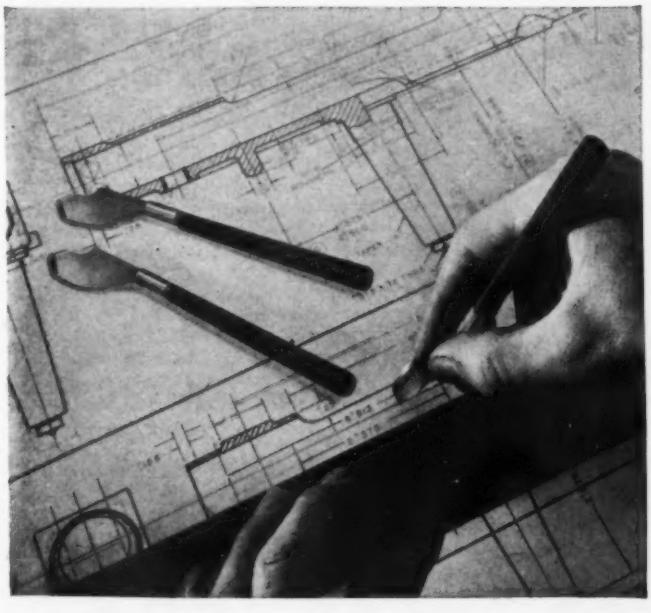
For samples and full information about the HELIOS line and what it can do for you, ask any K&E Branch or Dealer or write us here in Hoboken, N. J.

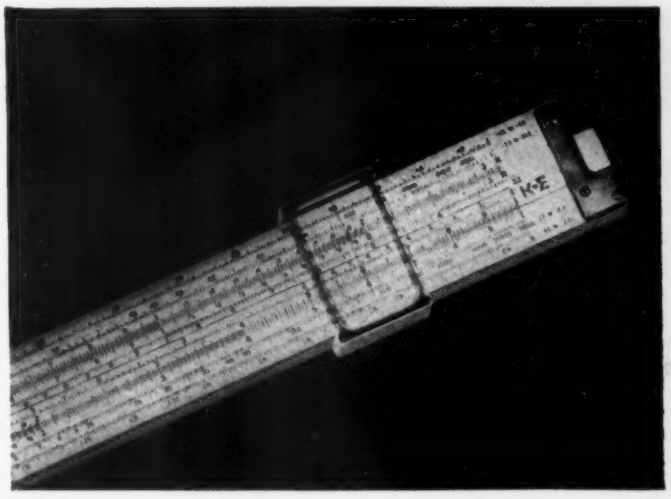
NEW TYPE RULING PENS

MARATHON† Ruling Pens hold several times more ink than ordinary ruling pens. They save refilling time, because they draw five to eight times more line between fillings. They are made in three fixed widths to rule three different widths of line. The ink-flow is regular and lines are always sharp, clean and uniform in width.

MARATHON Pens are easy to handle for guided curve lines or freehand contour line work. They can be laid down flat even when filled, without the ink running out. Easily filled, cleaned and sharpened. Sold in sets of three or singly.

Ask your K&E Dealer or K&E Branch to show them to you.





YOUR SLIDE RULE

To the engineer, scientist, mathematician and student, Slide Rules and K&E are synonymous. The new N4080 and N4081 LOG LOG DUPLEX TRIG and DECITRIG* rules, for instance, are typical of the thoroughly seasoned materials, the precision and detail of workmanship for which K&E Slide Rules have long been recognized as the standard of quality.

When you need a Slide Rule, insist on K&E.

*Trade Mark®
†Trade Mark

KEUFFEL & ESSER CO.

EST. 1867

NEW YORK • HOBOKEN, N. J.

CHICAGO • ST. LOUIS • DETROIT • SAN FRANCISCO
LOS ANGELES • MONTREAL

Want Additional Product Information? See Page 19.

LARGE INDUSTRIAL GEARS

Bevel and mitre gears up to 60" dia. are cut on gear planers to accurate tolerances.

CUSTOM MADE GEARS

up to 145" diameter

You can save time, money and errors in your large and heavy industrial gear requirements with the prompt, custom service of SIMONDS GEAR. Within easy shipping distance of many heavy industry plants—with a personalized attention to your specific gear requirements—SIMONDS GEAR is able to assure you fast, accurate gear service for all heavier gear needs. Size range includes: Spur Gears up to 145"—Bevel and Mitre Gears up to 60"—Worm Gears up to 72"—also worms, worm gears, racks and pinions. Materials include: cast or forged steel, gray iron, bronze, silent steel, rawhide and bakelite. Place your next heavy gear inquiry with SIMONDS GEAR and test the difference!

Stock carrying distributors for Ramsey Silent Chain Drives and Couplings. V-Belts.

SIMONDS GEARS

THE SIMONDS GEAR & MFG. CO.

LIBERTY at 25th • PITTSBURGH 22, PA.

TAPE-DRIVE CABINET DIAL

THIS tape-drive cabinet dial unit is for use with floor scales, industrial built-in scales, motor truck scales, tank scales, and all types of overhead track and suspension scales. It is described as a flexible and wide range instrument, meeting the requirements of heavy, medium and light-duty industrial weighing. New tape-drive principle uses high-strength, non-corrosive special alloy tapes to replace the old style rack and pinion. Up to four drop-weights can be quickly put in or taken out of the weighing system. *The Howe Scale Co., Rutland, Vt.*

ALUMINUM ALLOY "CEE TYPE" SCREW CLAMPS

"CEE TYPE" screw clamps in aluminum alloy for use where resistance to extreme pressures is required, are available in three models: No. 350 heavy duty, deep throat frame pattern with I-beam design and double Acme thread (available in sizes of 4, 6, 8 and 10 full work opening inches); No. 325, with sliding bar, "sure-grip" handle in sizes from 3" to 12" work opening; and No. 300, a light duty clamp, 2½" to 6" work opening. Use of aluminum alloy is said to make them desirable for welding work because it reduces adhesion to welding flash. *Foster Aluminum Alloy Products Corp., 114-118 South Salina St., Syracuse 2, N. Y.*

HEAVY DUTY PLATFORM TRUCK

THIS heavy-duty platform truck, known as "The Freighter", is available in 7 platform sizes with either Rapid-Flame hardened nicro-steel, molded-on cushion rubber, or Durastan resinoid wheels. Weights run from 167 lbs. to 242 lbs. Truck is available in level type (with two load wheels on end and two swivel casters on other end) or tilt type (with two load wheels mounted at center of truck and one swivel caster mounted at center of each end). Capacity with nicro-steel wheels is 5,000 or 6,000 lbs., depending on type of casters; with molded-on cushion rubber wheels, 2,960 lbs. or 2,680 lbs. *The Rapids-Standard Co., Inc., Dept F-231, 342 Rapistan Building, Grand Rapids 2 Mich.*

(*Please turn to page* 170)

Faster LIFTING Safer LOWERING with SIMPLEX

RATCHET LOWERING JACKS

Specify Simplex for Top Efficiency on Heavy Duty Jacking

SIMPLEX HYDRAULIC JACKS

Available in eight models to handle from 3 to 100 tons — tested to 50% overload. Write for Bulletin HJ-47.

Use these single acting jacks for safe, sure work in lifting, lowering, pushing or pulling. Double lever sockets speed work in cramped quarters. All models lift full capacity on the toe or on the cap — a feature that only Simplex gives you. Available in 14 models—capacities from 5 to 35 tons, and lifts from 7 to 18 inches. For full information, ask for Bulletin: Industrial 48.

Simplex LEVER • SCREW • HYDRAULIC Jacks

TEMPLETON, KENLY & CO.

1014 So. Central Avenue, Chicago 44, Illinois

ARMSTRONG

New TOOL HOLDERS MAKE MORE PROFIT ON EVERY OPERATION

With ARMSTRONG TOOL HOLDERS you can take advantage of the new high speeds and heavier feeds of the newer cutting materials, without revolutionary changes or costly experimentation. They are the most profitable tools obtainable; the lowest in initial cost, the longest in service and most economical in use, for all incorporate the basic Armstrong Principle of small interchangeable cutter-bits in permanent drop forged shanks. They are the most readily obtainable tools too, for they are stocked by all leading distributors.

Write for NEW S-48 Catalog just released.

ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5203 W. Armstrong Ave., Chicago 30, U. S. A.

New York San Francisco

New G-E Wiring System Offers Unlimited Possibilities In Modern Lighting Control

Multiple Switching from Many Locations Available at Low Installation Cost With G-E Remote Control

Switch your garage lights ON or OFF from any room in your home—in hospitals, give every patient a light switch next to his bed—in industrial plants and commercial buildings, let every night watchman have a centralized bank of switches for all lights in his area. These are just a few of the many possibilities that can be brought about by the new remote control system, recently announced by the General Electric Company.

Easy to Install

Using existing methods for wiring all power circuits, the General Electric remote control system requires no new materials or techniques except in the switching circuit itself. In this circuit a small, low-voltage relay does the actual switching. Control of this relay can be placed practically anywhere in a building, simply by installing lightweight wires from the relay to conveniently located wall switches, specially developed for this purpose. "Easy as wiring a doorbell," is the way one observer described this circuit.

Because this new system cuts the cost of materials used in multi-switch applications, because it makes possible a large number of controls on any individual circuit, General Electric remote control clears the way for wide use of multi-switch control in structures of all types.

Keeps Costs Down

In residential wiring, this new system means real "dream-home" electrical control even in residences where costs must be cut to the bone. Simple applications include the example of garage lights given above—also attic fan and cellar light controls in various parts of the house. In the completely modern house, all lights and outlets can be controlled from various locations.

In dormitories, institutions, and commercial buildings, General Electric remote control can provide an effective centralized system for lighting control. Wherever "lights-out" regulations are in effect, a master panel of remote control switches can be used to enforce these regulations for an entire building or a whole floor. In commercial structures or plants, a similar system can be used to turn out lights left on after hours. Commercial and industrial operations can profit by the over-all multi-switch control offered by this system.

Offers New Ideas

To everyone concerned with building and remodeling, this new system offers a completely new range of ideas on flexibility in the use of electricity. To the architect, it means a new era in electrical convenience in structures of all sizes and types. To the buyer and the investor, it means increased workability and extra value, now and in the years to come. To the electrical contractor, General Electric remote control offers a vast, new field for his services.

To answer questions on the applications of General Electric remote control—to explain the procedure and the materials required—the General Electric Company has prepared an informative booklet on the subject. This booklet is a valuable guide for everyone interested in this new system. To get your copy early, simply fill out the coupon and mail it today.

Here are the essential components of the new General Electric remote control system: the switch, the small transformer (not shown), the relay, and the lightweight No. 18 wire. All accessories necessary for the system are manufactured by General Electric and sold through your General Electric Construction Materials distributor.

Learn the Facts on this Important New System
Mail Coupon Now

Section D28-270
General Electric Company
Bridgeport 2, Connecticut

Please send me your new booklet on General Electric remote control.

(Name)_____ (Title)_____

(Company)_____

(Street)_____

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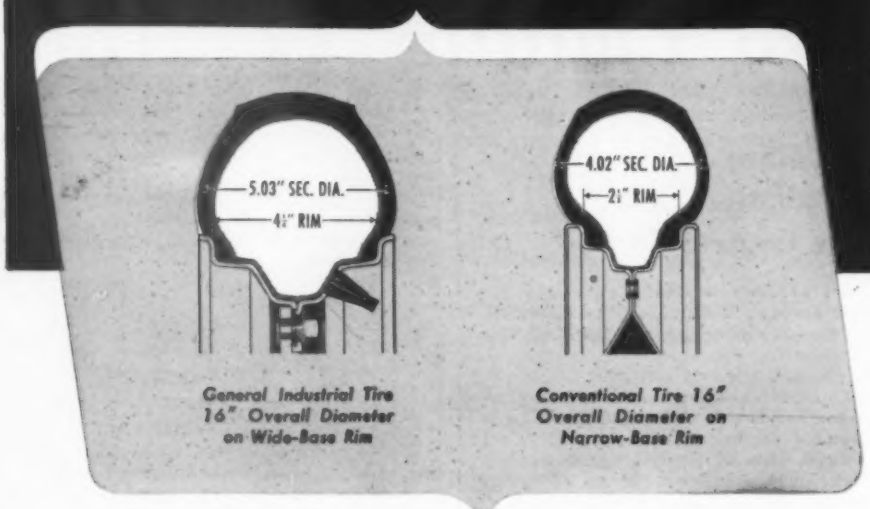
GENERAL ELECTRIC

Want Additional Product Information? See Page 19.

Wide Base General Industrial Pneumatics

SAVE TIME • MONEY • LABOR


5.03" SEC. DIA.
4½" RIM
4.02" SEC. DIA.
2½" RIM
General Industrial Tire 16" Overall Diameter on Wide-Base Rim
Conventional Tire 16" Overall Diameter on Narrow-Base Rim

WIDE BASE MEANS

- **Greater load capacity at high and low speeds**
- **Better cushioning of loads and equipment**

General's exclusive wide-base rim makes the big difference. Heavier loads move faster, easier. Fragile cargoes and delicate equipment roll smoothly ...breakage is minimized. That's why industries everywhere are adopting wide-base Generals as standard equipment. Investigate today. You'll find General Industrial Pneumatics do a better job on any mobile equipment where small tires and wheels are used.

Available in complete assemblies of tire, tube and rim or tire only

O. D. SIZES 8 INCHES TO 22 INCHES

Write Today New catalog shows how to save time, labor, money with General Industrial Pneumatics. Dept. 7, The General Tire & Rubber Co., Akron, Ohio.

THE GENERAL TIRE & RUBBER CO.
AKRON, OHIO

The GENERAL TIRE

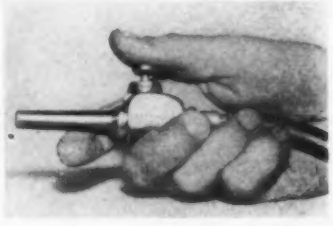
HIGH SPEED SHEAR

THIS high-speed shear, called the "Grampus" has an unusually small head and base, so that material of almost any odd shape can be placed over the head or under the base for quick, efficient and burr-free cutting. Shear is excellent for fast inside cutting, both straight and contour, by means of a simple locking device. No starting hole is required for inside work. Will handle pipe work, pans, channels, etc. of various diameters and depths, within the limits of its 7" throat. Literature available. *Federal Machinery Co., 134 Grand St., New York 13, N. Y.*

LARGE CHAMBER GAGE

ACCURACY of level reading not heretofore possible is claimed for this large chamber gage for use in gaging liquids that boil, where the liquid fluctuates rapidly in the glass. The gage chamber has been built to such large diameter that the effect of the boiling action and fluctuation on the liquid level is minimized, allowing close level readings. The gage is indicated for use on light end services. It is also valuable as a visual standpipe. *Jerguson Gage & Valve Co., 80 Fellsway, Somerville 45, Mass.*

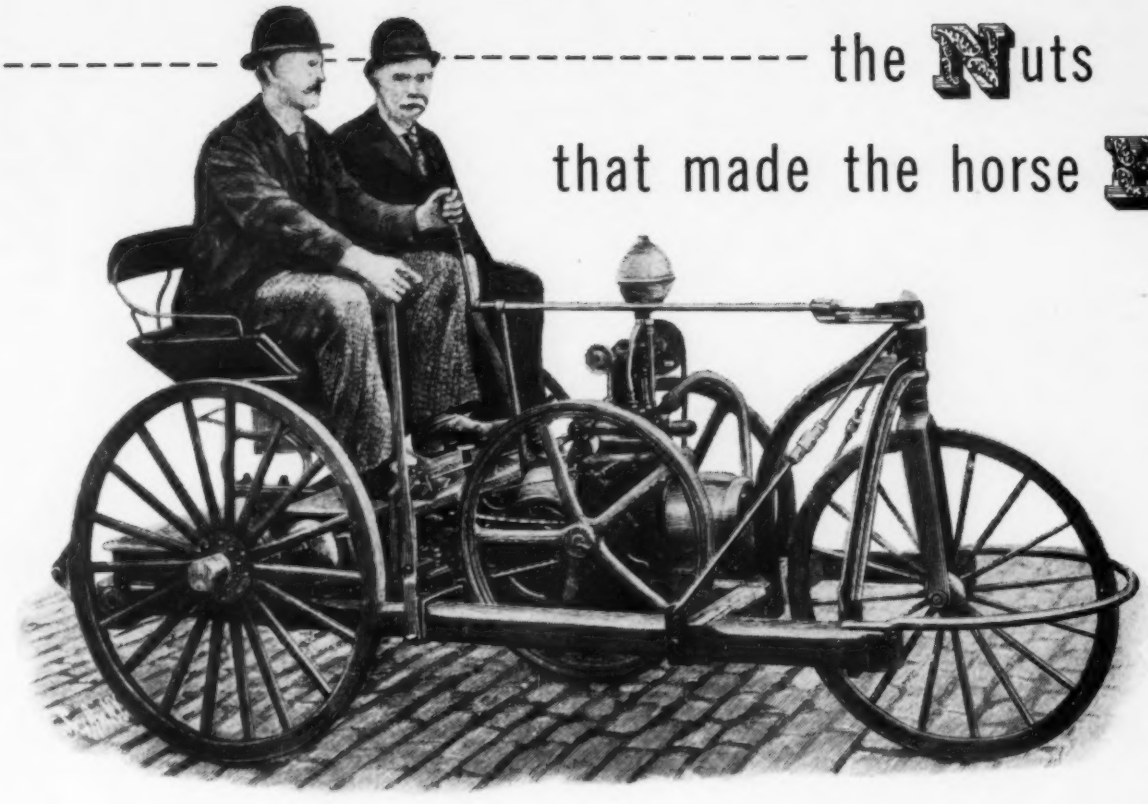
SPRINGLESS AIR HOSE VALVE



GENERAL-PURPOSE air hose valve and nozzle has no springs, no packing, and requires little thumb pressure to open, and instantly snaps tightly shut when actuating plunger is released. The valve is for any air line up to 100 psi. Polished, high-chromium stainless steel in all working parts. Available for ⅛" or ¼" hose sizes, both with bodies tapped for standard ¼" pipe threads. Nozzle extends approximately 2½". *Paul Valve Corp., 683 Third Avenue, New York 17, N. Y.*

(*Please turn to page* 174)

the Nuts that made the horse Bolt



In 1895, when these brash boys came tricycling along "propelled by explosive gas," the scoffers said, "Get a horse!" But men of vision saw that the horse was doomed as a common carrier.

The Blake & Johnson Company was already 46 years old then but the records don't say whether this pre-historic three-wheeler benefited by Blake & Johnson fastenings. We do know that our fastenings in ever-increasing number have gone into "modern" conveyances from the early gas buggies to today's streamliners of road and rail, sea and air.

Blake & Johnson moves vigorously ahead! As recently as 1943, when we introduced the revolutionary Twin-Fast twin-thread wood screw, some old-timers looked askance. But Blake & Johnson engineers said, "It's the wood screw of the future." And the future is today!

Write for catalog of complete line of Blake & Johnson fastenings.

Machine Screws and Nuts, Wood Screws, Stove Bolts, Tapping Screws

Screw Machine Products, Wire Forms, etc.

THE BLAKE & JOHNSON COMPANY — **WATERVILLE 48, CONN.**

1849 — 1949

A *Century* OF MANUFACTURING OF FASTENING DEVICES FOR INDUSTRY

Herbrand DROP FORGINGS

.....any size or shape up to 200 lbs.

Precision made forgings bearing the Herbrand "Diamond H" trade mark will more than meet your most exacting specifications. Enduring stamina is built into these quality forgings through scientific heat treating in modern automatically controlled furnaces.

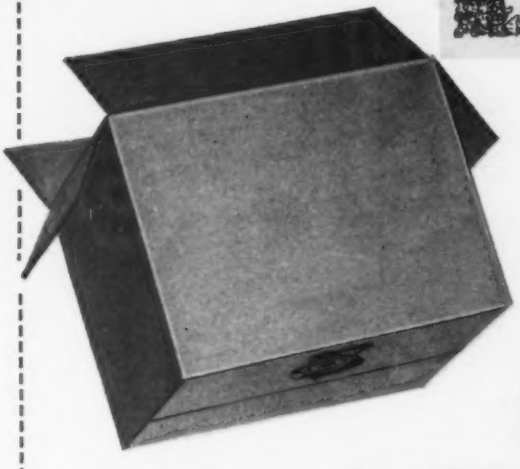
Whatever your requirements in forgings, Herbrand is your most faithful source of supply . . . as it has been for hundreds of industries since 1881. Your inquiries are solicited.

SINCE 1881
Herbrand
SUPER-QUALITY DROP FORGINGS
..the finest money can buy!

HERBRAND DIVISION
THE BINGHAM-HERBRAND CORP., FREMONT, OHIO

A Pedigree is a Promise of Quality . . .

IN BOXES TOO!



PROMISE OF *Quality*
PROMISE OF *Service*
PROMISE OF *Fair Price*

THE PEMBROKE WELSH CORGI, as we know it today, traces its history back to 1107 when Flemish weavers brought it over to Wales to serve as a cattle dog. Hardy, alert and intelligent, members of this little breed make very rewarding household pets.

THE Union shield trade mark identifies boxes with a pedigree that goes back to the timber in Union's own forests.

Only fibre from fresh cut trees goes into Union boxes and completely integrated production, under one management in the world's largest Kraft pulp-to-container plant, is checked and rechecked every step of the way to maintain consistent high quality standards without variation.

Five of the nine largest paper machines in the world and four modern box plants are your assurance of getting Union boxes when and where you need them.

And 75 years of leadership in paper packaging stands ready to help you in any problem of package engineering or design.

UNION *Corrugated Containers*

UNION BAG & *Paper Corporation*

Principal Offices: WOOLWORTH BLDG., NEW YORK 7, N. Y.

Corrugated Container Plants: **SAVANNAH, GA. • CHICAGO, ILL. • TRENTON, N. J. •**

Want Additional Product Information? See Page 19.

OUT OF 1001 TEST TUBES

The Chicago Mounted Wheels you use today look simple enough — abrasive wheels mounted on steel shanks, *but*—

Those little wheels are the result of more than 50 years of know-how and more than 1001 tests to determine the most exactly perfect combination of grain, grade, bond, shape, shank length and steel analysis to do each job.

FORWARD-LOOKING is the Word

Use Chicago Mounted Wheels — the first wheels ever to be mounted on their own steel shanks — today's finest.

AND, the same expert craftsmanship that has made Chicago Mounted Wheels the most widely used in industry today accounts for the outstanding results you get with Chicago Grinding Wheels and Cut-off Wheels.

FREE ENGINEERING SERVICE

Let us help you with your grinding problems. Send for our Engineering Data Sheet making it easy for you to submit information from which we can recommend the abrasives that will do your jobs best.

CHICAGO WHEEL & MFG. CO., 1101 W. Monroe St., Dept. PG, Chicago 7, Ill.

WRITE FOR FREE CATALOG

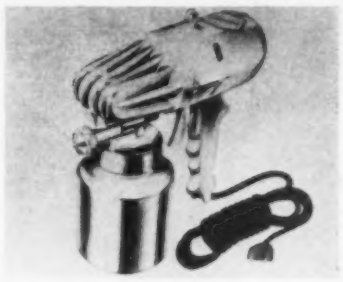
☐ Send Engineering Data Sheet ☐ Send Catalog

Name .....

Address .....

.....

SELF-CONTAINED SPRAYER

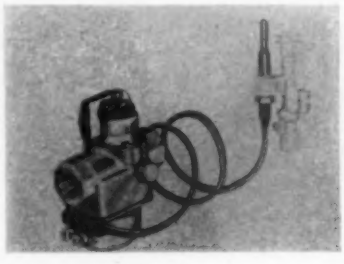


PORTABLE Payswell sprayer for small industrial painting jobs operates with a built-in compressor, eliminating the need for hose or separate motor. Total weight is 4 lbs., including the quart container. The enclosed motor operates from any 110-volt electrical outlet, a-c or d-c, at a speed of 10,000 rpm, producing over 50 lbs. pressure. Interchangeable nozzles provide a spray pattern of either cone or fan shape. Can also handle deodorants, insecticides, liquid waxes, liquid plastics, etc. *Sellco Corp., 815 Andrus Bldg., Minneapolis 2, Minn.*

SWEEPING BRUSHES WITH STEEL BACKS

SPEED sweep bushes for clean, easy, fast sweeping are available in 12 styles and sizes for varying conditions. Features include light weight; non-splitting steel back; 60" handle that is quickly adjustable to the height of the sweeper; tufts arranged to give "spring and snap" action. Maker claims brushes will give up to 300% longer service than ordinary brushes. *Milwaukee Dustless Brush Co., 530 North Second Street, Milwaukee 3, Wis.*

GAS COCK SAFETY



MR-2-5 is an all-in-one, simplified, on-off and safety shut-off control unit for floor, central, small space and water heaters. Flow of all gas automatically stops when the pilot is extinguished. During reset operation, gas flows to the pilot burner only. No gas can pass to main burner until pilot is ignited and safety valve set in operating position. Installation in any position is possible. The unit is suitable for natural, manufactured, mixed, and liquefied petroleum gases. Bulletin available. *General Controls Co., 801 Allen Avenue, Glendale 1, Calif*

(*Please turn to page* 178)

K&M "Century" Asbestos Corrugated

for long life without maintenance...

The "new" roof on this industrial building is actually more than 3 decades old! A coal operator installed these "Century" Asbestos Corrugated sheets on a coal tipple 33 years ago before he re-used them here.

for modern architectural effect...

Beauty in typically modern style is brought to this store with a facade of "Century" Asbestos Corrugated. This beauty will *last* without any painting or other expensive upkeep.

You've probably noticed that "Century" Asbestos Corrugated is growing in popularity for decorative motifs...inside and outside...for industrial plants, stores, restaurants, theaters. There's a rugged attractiveness in the simplicity of the corrugations and neutral light-gray coloring.

And perhaps it's no news to you that "Century" Asbestos Corrugated is thoroughly practical from the *structural* point of view. It actually *toughens* with age. Never needs to be painted. Can't rot, corrode, catch fire, or succumb to termites.

NEW "TOP-SIDE" FASTENERS CUT ROOFING COSTS

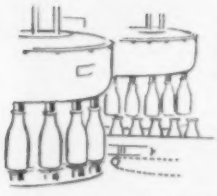
On top of all this, you can specify the new "TOP-SIDE" Fasteners, and cut a big slice off the cost of roof installation over steel purlin construction. Exclusive with "Century" Asbestos Corrugated, these new fasteners permit roofing to be done entirely from *atop the roof* ...eliminating entirely the costly labor and scaffolding normally required beneath. This feature, alone, is worth looking into—write us for full details.

Nature made Asbestos...Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

Want Additional Product Information? See Page 19.

Stop Corrosion ...Use Globe Stainless Steel Tubes



When corrosion is found in tubing or metal parts formed from tubing, Globe Steel Tubes Co. can help you solve that problem. Not by suggesting just any stainless steel tubing . . . but by recommending the correct analysis and metallurgical properties of the Globe Stainless Steel Tubing to best meet your specific operating conditions.

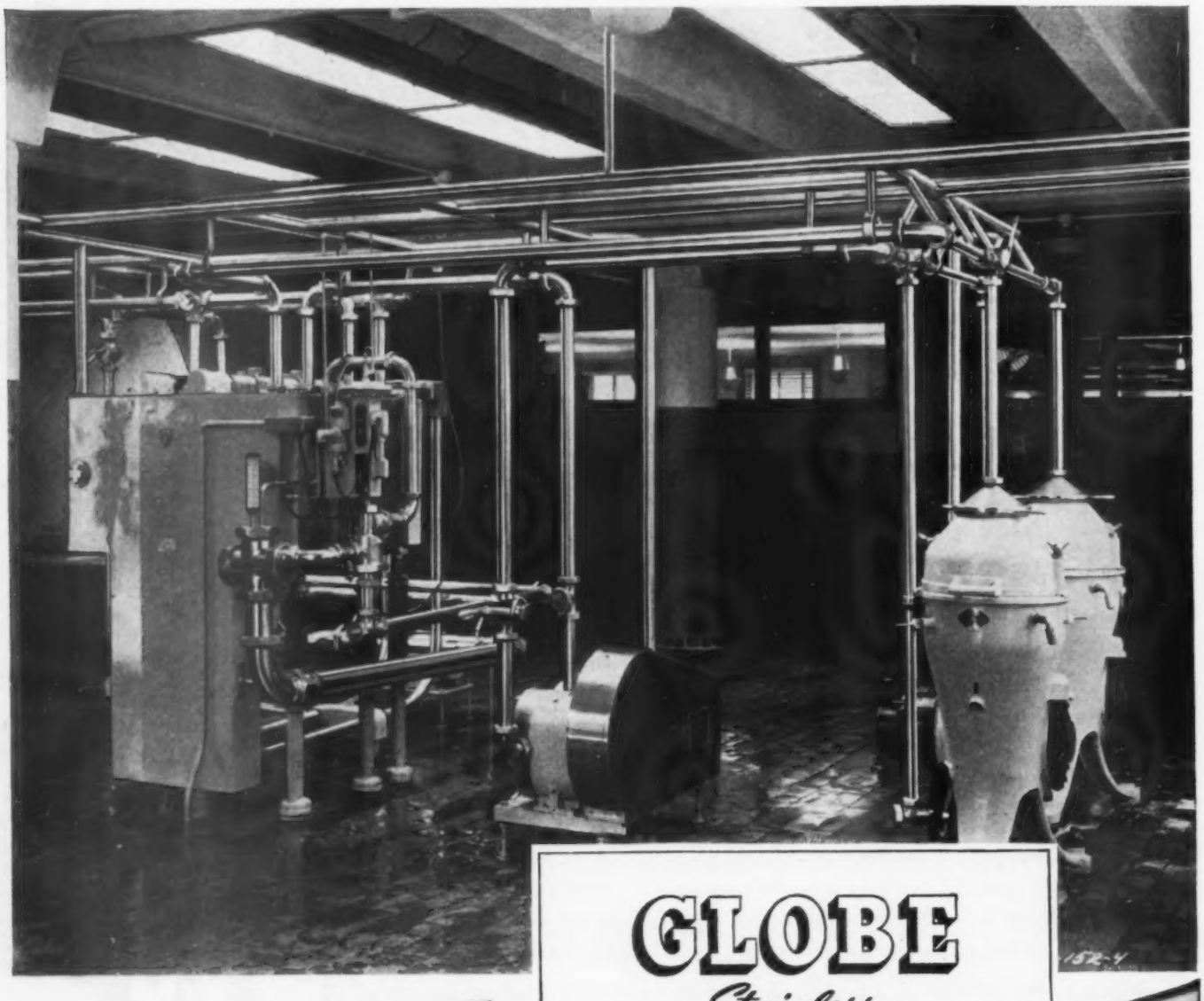
Globe Steel Tubes Co. can do this because they study the problem in cooperation with your engineers in your plant and in Globe's completely equipped metallurgical, physical and chemical laboratories. Result: You get recommendations for the specific analysis and metallurgical properties of stainless steel tubing in the size and finish you need to do your job best at maximum economy.

Globe Steel Tubes Co. has been rendering this service to industry for 40 years. Many of your problems involving tube failure, metallic contamination, corrosion, scaling and sanitation are an old story to Globe. Chances are, the answer to your problem is immediately available for the asking.

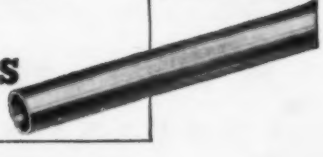
Let Globe Steel Tubes Co. assist you in surveying your tubing needs and problems, and you are assured of an outstandingly dependable source for steel tubing of all kinds: Stainless, Mechanical, Alloy Steel and Pressure . . . in a wide range of sizes and types to meet your requirements . . . plus the engineering and research facilities to solve your tubing problems.

GLOBE STEEL TUBES CO., Milwaukee 4, Wisconsin

Photo courtesy Creamery Package Mfg. Co.

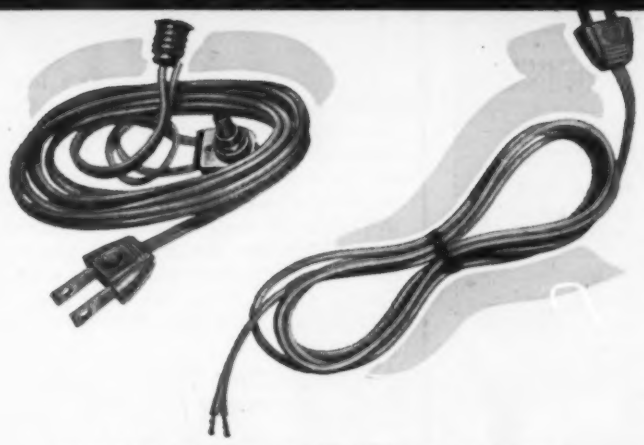


GLOBE
Stainless
STEEL TUBES



Free valuable technical data in Globe Steel Tubes Co.'s new "Bursting Pressure Bulletin No. 112A".

Wiring Components FOR PRODUCT DESIGN



CAN YOU USE THIS COST-CUTTING SERVICE?

Here's a service designed to cut your assembly time and increase your selling story. It's the General Electric Flamenol* cord set service—a service designed to cut product assembly time to an absolute minimum.

Here's what we did for one manufacturer: In addition to the standard molded-on plug, and cord with stripped and twisted ends, we included both a switch and a socket. (This time-saving assembly is shown at left, above.) If you produce your product in volume, you'll be interested in this General Electric service. But . . .

If you have no assembly problems, you can order standard General Electric Flamenol cord sets in ready-cut lengths of 6, 8, and 11 feet. They make work easy because ends are stripped and twisted for easy connection. And . . .

They are visible evidence of high quality on any product. That's why General Electric Flamenol cord sets are boosting sales of cord-equipped products all over the country.

Flamenol cord sets have a strong, molded-on plug that keeps the double-strength prongs straight and true. The smooth, thermoplastic insulation cleans in a jiffy with a quick wipe and won't fray, kink or pull loose from the plug.

We've made millions of them for use on clocks, lamps, fans, radios and a host of other light-duty appliances, so why not take advantage of our experience? Just tell us what you want, and we'll tell you what we can do. Check box A below.

CORDS BUILT TO TAKE TOUGH TREATMENT

That's a built-in feature of every General Electric portable cord—ability to take the same tough treatment you've designed into your product.

For example, Type ST Flamenol heavy-duty portable cords are designed to give long term, dependable service under severe operating conditions. They are flexible, light in weight, easy to handle and mechanically tough and strong. The thermoplastic jacket is resistant to water, oils, alkalies, sunlight and acids. Type ST cords are recommended for use on portable tools in industrial plants, mines, garages, packing houses, and similar tough-duty locations.

Perhaps your product does not require a cord built to meet such heavy duty requirements. But whatever your requirement—from light-duty appliance to heaviest tool—there is a General Electric portable cord to supply power to it.

Do you have a power cord problem—would you like to know more about General Electric portable cords? Just check C in the coupon.

Today's emphasis on greater power output from smaller motor frames makes magnet wire selection more important than ever before. That's why it's a wise designer who investigates the many features of General Electric Deltabeston* magnet wire before writing his specs.

Deltabeston magnet wire can take overload temperatures as high as 200 C. The purified-asbestos insulation is firmly bonded to the conductor with a special heat-resisting adhesive and by an exclusive process. This tough, flexible insulation, plus the extreme softness of the copper, permits the use of Deltabeston for the most intricate winding applications.

But get the whole story. We've prepared it in an interesting booklet that includes a handy table to simplify selection. If you'd like a free copy, just check B in the coupon below.

General Electric Company (Section L3-270)
Construction Materials Department
Bridgeport 2, Connecticut

Please send me, free, the items checked below:

A ☐ General Electric Flamenol cord set service
B ☐ Deltabeston Magnet Wire Booklet
C ☐ Information on General Electric portable cords
D ☐ Information on the subject attached

Name _____

Company _____ Title _____

Street _____

City _____ Zone _____ State _____

GENERAL ELECTRIC

ade-mark Reg. U. S. Pat. Off.

TRIPLEX *makes 'em*

CAP SCREWS

Hex, flat, fillister or button heads. Sizes to 1" by 8", inclusive.

SET SCREWS

Square head, cup points. Sizes to ¾" by 4", inclusive.

tough!

The proof of a product

is in its performance.

TRIPLEX threaded fasteners

have demonstrated their

rugged holding power

on all types of

heavy equipment.

They're made right!

They hold tight!

If you don't already have our complete catalog, just drop us a line — today.

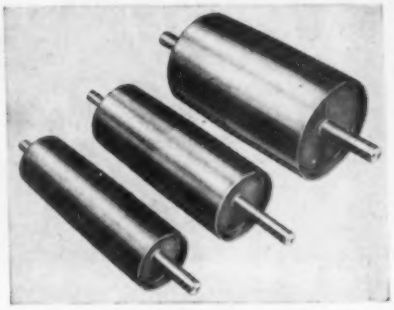
TRIPLEX SCREW COMPANY

5331 Grant Avenue, - Cleveland 5, Ohio

TRIPLEX *for* TOUGHNESS

CAP AND SET SCREWS · BOLTS, NUTS AND RIVETS

WIDE FACE CONVEYOR PULLEYS

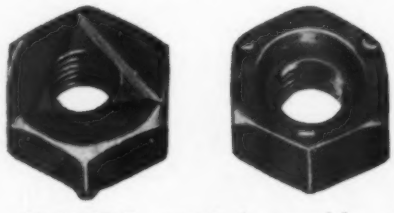


CONVEYOR pulleys of extra length are sturdily built of welded steel and can be had in lengths up to 10 feet and in diameters ranging from 4" to 16". They can be supplied with either crown face or straight face and either with hubs or welded to the shaft as shown in illustration. They are described as precision built for long life and trouble-free service. *Samuel Olson Mfg. Co., Inc., Dept. I, 2418 Bloomingdale Ave., Chicago 47, Ill.*

DIEMAKER'S TRYOUT AND ASSEMBLY MACHINE

ONE diemaker can perform all the operations of die-assembling — take apart, turn over, drill, tap and try out—without physical effort on this "mechanized" machine, known as the Die Flipper. One man operating the machine can quickly and efficiently test alignment, drill punches in place, tap for screw holes, hand stone and make visual inspection, maker claims. Plus function of the machine is that of a radial drill on angular as well as straight holes. *Moore Special Tool Co., Inc., 744 Union Ave., Bridgeport, Conn.*

LOCK, WELD NUT COMBINATION



TROUBLE caused by particles of welding metal dropping into nut threads during projection nut-welding process is said to be overcome in the Gripco 3-point projection Weld Nut. Bottom of the nut is counterbored about a quarter of the way through, causing metal particles to fall on the counterbored portion (which slants outward). Thickness of the nut is increased to compensate for the threads removed by counterboring. Nut has three projections for welding contact. Picture shows "double triangle" thread-locking feature at left, and counterbore at right. *Grip Nut Co., 308-M So. Michigan Ave., Chicago 4, Ill.*

(*Please turn to page* 182)

...10 TIMES EACH WAY!

Chase wire for cold-heading passes this GRUELING TEST every day!

As one of the means of assuring you the very best quality wire, each Chase copper-alloy wire coil is subjected to this severe twist and reverse twist test.

No seams, slivers or other surface physical defects can hide from *this* searching test. And it's just one of many! Chase wire for cold-headed products is also subjected to a compressing or upsetting test that simulates a very severe heading operation.

In addition, Chase wire must be uniform in surface texture and color, have accurate dimensions, be precisely tempered. And there's a Chase copper-alloy wire for *every need!* Write the nearest Chase Warehouse or Service Office, and be *sure* of the best.

Chase

the Nation's Headquarters for
BRASS & COPPER

WATERBURY 91, CONNECTICUT

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

THIS IS THE CHASE NETWORK . . . *handiest way to buy brass*

ALBANY† ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DETROIT INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER† SAN FRANCISCO SEATTLE ST. LOUIS WATERBURY *(†Indicates Sales Office Only)*

How the proper application

of wire rope

-may save you money

● Every user wants to get the best possible service out of his wire rope but it is amazing how often simple rules are broken in the field. Some operators are careless when installing a new rope . . . they keep machines running when sheaves are badly worn . . . they overload the rope . . . they forget to lubricate the rope.

To help eliminate these human failings, the American Steel & Wire Company maintains a staff of TIGER BRAND Wire Rope Specialists. These men are experienced field service engineers. If you have not checked your equipment recently, for correct wire rope application, call in the TIGER BRAND Specialist. He'll do the job for you without charge. Here are some of the points he checks before recommending the proper wire rope for your job—

1. Method of installing and caring for rope.
2. Diameter of sheaves and drums, and condition of grooves.
3. Arrangement of sheaves.
4. Fleet angles.
5. Loads handled.
6. Rope speeds, acceleration and deceleration.
7. Presence of vibration, whipping.
8. Lubrication.
9. Corrosion.
10. Amount of scrubbing and abrasion.
11. Fitting attachments.
12. Abuses to be corrected.
13. Analysis of service records.
14. Finally: Recommendation of the correct rope to meet all conditions.

To show you how you can save money on wire rope, we have prepared a booklet on proper wire rope application that every user of wire rope should read. You can get a copy by mailing the coupon.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SEND FOR NEW FREE BOOKLET

American Steel & Wire Company
Rockefeller Building, Dept. G-8
Cleveland 13, Ohio

Gentlemen:

Send me your booklet, "Valuable Facts about the use and care of Wire Rope."

Name.....

Position.....

Company.....

Address.....

USS

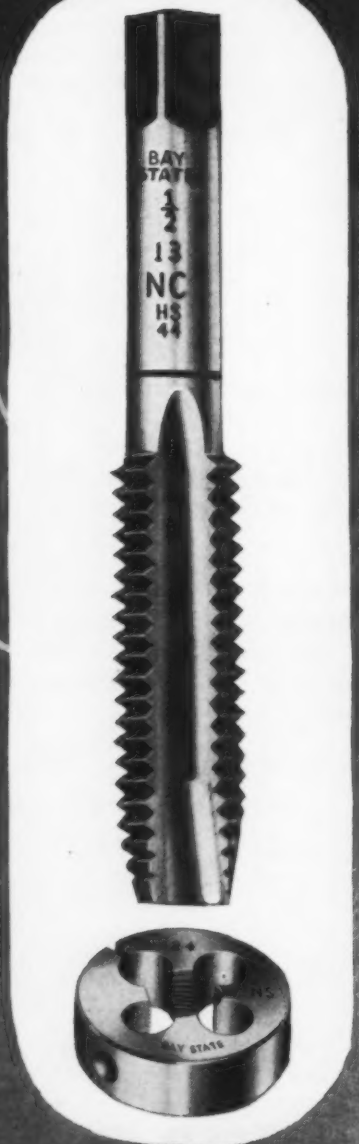
AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

BAY STATE
TAPS & DIES

FIRST CHOICE
for PRECISION PERFORMANCE



On Nearby Shelves of Your Industrial Supply Distributor

BAY STATE TAP & DIE COMPANY
MANSFIELD, MASSACHUSETTS

NON-ACID SOLDERING FLUX

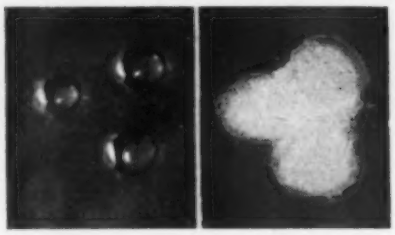
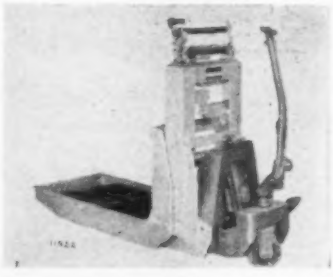


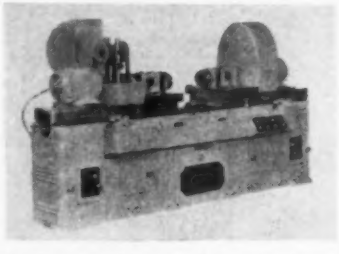
ILLUSTRATION shows copper sheet with a light oxide coating which was covered with machine oil. Three drops of ordinary flux applied to section on left "balled up", did not penetrate. Three drops of Divco #229, a new non-acid soldering flux, as shown on the right, penetrated through the oil, spread wet and fluxed the surfaces. The new flux is said to permit perfect sweating of long, deep and irregular seams as well as diaphragms and other critical soldering work. Literature available. *Division Lead Co., Dept. 110, 836 W. Kinzie St., Chicago 22, Ill.*

LIFT TRUCK SCALE



CANTILEVER type scale with a capacity of 1 to 2½ tons makes it unnecessary to transfer palletized loads from lift truck to scale and back again. Tare bars are mounted at eye level for quick reading. The scale can be permanently attached to virtually any make of lift truck, maker states. *Weishor Corporation, 1029 N. Seventh St., Milwaukee, Wis.*

PRECISION BORING MACHINE



MODEL 2UA precision boring machine incorporates a new sealed lubrication system in the precision boring heads that is said to eliminate the entrance of foreign matter and to result in cooler operation. One piece bed design makes for accuracy in precision boring and provides greater rigidity on heavy roughing operations. Picture shows belt guard for the left head opened to illustrate simplicity of the spindle drive details. *The Simplex Machine Tool Division, Stokerunit Corp., Milwaukee, Wis.*

(*Please turn to page* 186)

QUICK SERVICE from 15 District Sales Offices

Of special interest to purchasing agents is the wide range of highest-grade Monsanto heavy chemicals and intermediates now available... Many of these products have been very difficult to obtain in recent years.

To make it easy for you to deal with Monsanto, fifteen District Sales Offices are ready to give prompt service on these and many other chemicals for industry. For full information, samples, prices, simply phone any of the numbers listed here — or write MONSANTO CHEMICAL COMPANY, Desk B, Organic Chemicals Division, 1755 South Second Street, St. Louis 4, Missouri.

DISTRICT SALES OFFICES:

St. Louis (Main 4000)
New York (Plaza 9-8200)
Philadelphia (Locust 4-0247)
Chicago (Whitehall 6750)
Boston (Liberty 2-6440)
Detroit (Trinity 2-5728)
Cleveland (Superior 3830)
Cincinnati (Dunbar 1414)
Charlotte (2-3454)
Birmingham (7-0677)
Houston (Atwood 8-6421)
Akron (Hemlock 6191)
Los Angeles (Michigan 6048)
San Francisco (Yukon 6-6232)
Seattle (Main 4203)
Portland, Ore. (Beacon 6740)
In Canada: Monsanto (Canada) Limited, Montreal (Marquette 4236)

MONSANTO HEAVY CHEMICALS

Chrome Sulfate (Santotan*)
Salt Cake (Sodium Sulfate, Technical)
Sodium Sulfite Anhydrous, Technical (Santosite*)
Sulfur Dioxide
Chlorosulfonic Acid
Muriatic Acid
Nitric Acid
Sulfuric Acid†

INTERMEDIATES

***para*-Aminobiphenyl**
***para*-Nitrobiphenyl**
***ortho*-Anisidine**
***para*-Anisidine**
Benzoic Acid, Technical
Benzyl Chloride
Dichloroaniline
***ortho*-Chloroaniline**
***para*-Chloroaniline**
***ortho*-Chlorophenol**
***para*-Chlorophenol**
Cyclohexylamine
Dicyclohexylamine
Dinitroaniline
Dinitrochlorobenzene, 46.5°
Dinitrochlorobenzene, 48°
***ortho*-Nitroaniline**
***ortho*-Nitrochlorobenzene**
***ortho*-Phenetidin**
***para*-Phenetidin**
Phenolsulfonic Acid
Sodium Benzoate, Technical
Thiourea
***para*-Toluenesulfonamide**
***para*-Toluenesulfonchloride**
Toluenesulfonic Acid

*Reg. U. S. Pat. Off.

†If you are a large consumer of sulfuric acid, Monsanto's Engineering Sales Department will gladly give you full details on Monsanto-designed contact plants for low-cost production.

MONSANTO
CHEMICALS AND PLASTICS

MONSANTO CHEMICAL COMPANY
Desk B, Organic Chemicals Division
1755 South Second Street, St. Louis 4, Missouri
Please send me full information ( ), prices ( ), samples ( ) of_____

Name_____ Title_____
Company_____
Address_____
City_____ State_____

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Want Additional Product Information? See Page 19.

LOOK

at this hacksawing record!

PERFORMANCE of a single "JET-EDGE" Blade

MONDAY
40 pieces 3¼" Nitroloy

TUESDAY
50 pieces 1" x 5"
Cold Rolled Steel

WEDNESDAY
40 pieces 4½" 50 Carbon
Chrome Moly Steel

THURSDAY
10 pieces 4½" 50 Carbon
Chrome Moly Steel
12 pieces 6" Standard Steel Pipe
30 pieces ¾" x 5" SAE 1020

FRIDAY
4 pieces 6¾" Rytense

SEE what "Jet-Edge" can do for you.

In metal cutting, records like this mean money saved. "Jet-Edge," that rugged, unbreakable new blade with a super high speed edge welded to an extra strong back, will out-perform the best blade you've ever used. It will actually save you 20% to 50% on your power hacksawing costs, even under toughest cutting conditions.

WRITE for a free demonstration.

Find out *why* and *how*. We'll be glad to arrange a demonstration on your own work. No obligation — except an open mind for one of the most astounding performances you have ever seen.

MILLERS FALLS COMPANY, Dept. M
Greenfield, Massachusetts

MILLERS FALLS TOOLS

It's new!

It's "Jet-Edge"!

It's Millers Falls!

7 FT., 630 LB.

GIANT BAND SAWS

SHIP AT LOWER COST IN

WIREBOUNDS

265 pound crates previously required to pack the 20-inch bandsaws manufactured by the Crescent Machine Division of the Rockwell Manufacturing Company made shipping costly from both weight and space viewpoints. Then Wirebounds came on the scene to solve both problems.

Wirebound engineers designed a special four-piece Wirebound crate that weighed only 128 pounds and permitted loading four extra units in a freight car. The Wirebound crate afforded even greater shipping protection to minimize damage in transit.

The result . . . a 14% saving in over all shipping weight! And more, substantial reductions in actual packaging costs! Mail the coupon below . . . see how you can save with Wirebounds!

Wirebound BOXES & CRATES

SIXTY WIREBOUND PLANTS THROUGHOUT THE UNITED STATES

PHOTO a
Special interior packing fits snugly into place, provides added strength and protection.

PHOTO b
The Wirebound "mat" is wrapped around and closed, in this case by twisting wire ends.

PHOTO c
As a final operation the lid drops into position and is secured in a few moments.

WIREBOUND BOX MFG. ASS'N.
Room 1221, Rorland Building, Chicago, Illinois

☐ SEND COMPLETE LITERATURE ☐ SEND A SALES ENGINEER

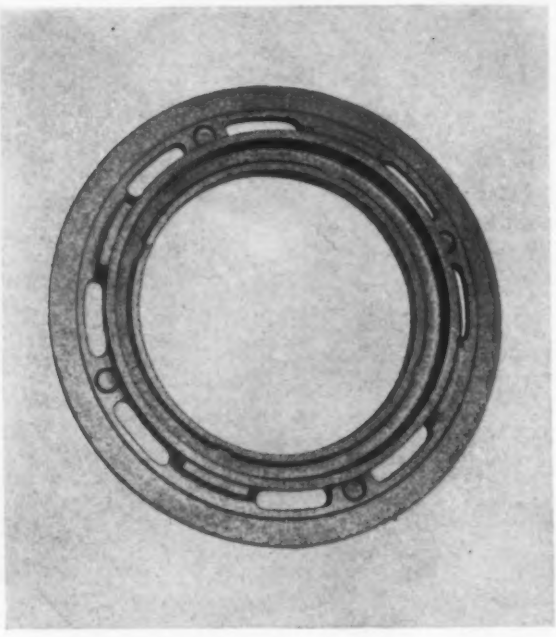
NAME POSITION

FIRM NAME

ADDRESS ZONE STATE

CITY PRODUCT

Can **You** Name it?*



Another name might be the
PRODUCTION CASTING OF THE MONTH

SUPERIOR FOUNDRY OF CLEVELAND, OHIO

will show you monthly an outstanding example of production castings...

that our modern and completely staffed and equipped Foundry turns out regularly for satisfied customers. They know that it saves them time, money, and production headaches to always bring their casting problems to

SUPERIOR

SUPERIOR FOUNDRY, INC.
3542 EAST 71st STREET • CLEVELAND 5, OHIO
MICHIGAN 3078

*It's a Clutch Pressure Plate that must be wear resistant and able to retain its size and shape under sudden stressing conditions.

INDOOR-OUTDOOR THERMOMETER

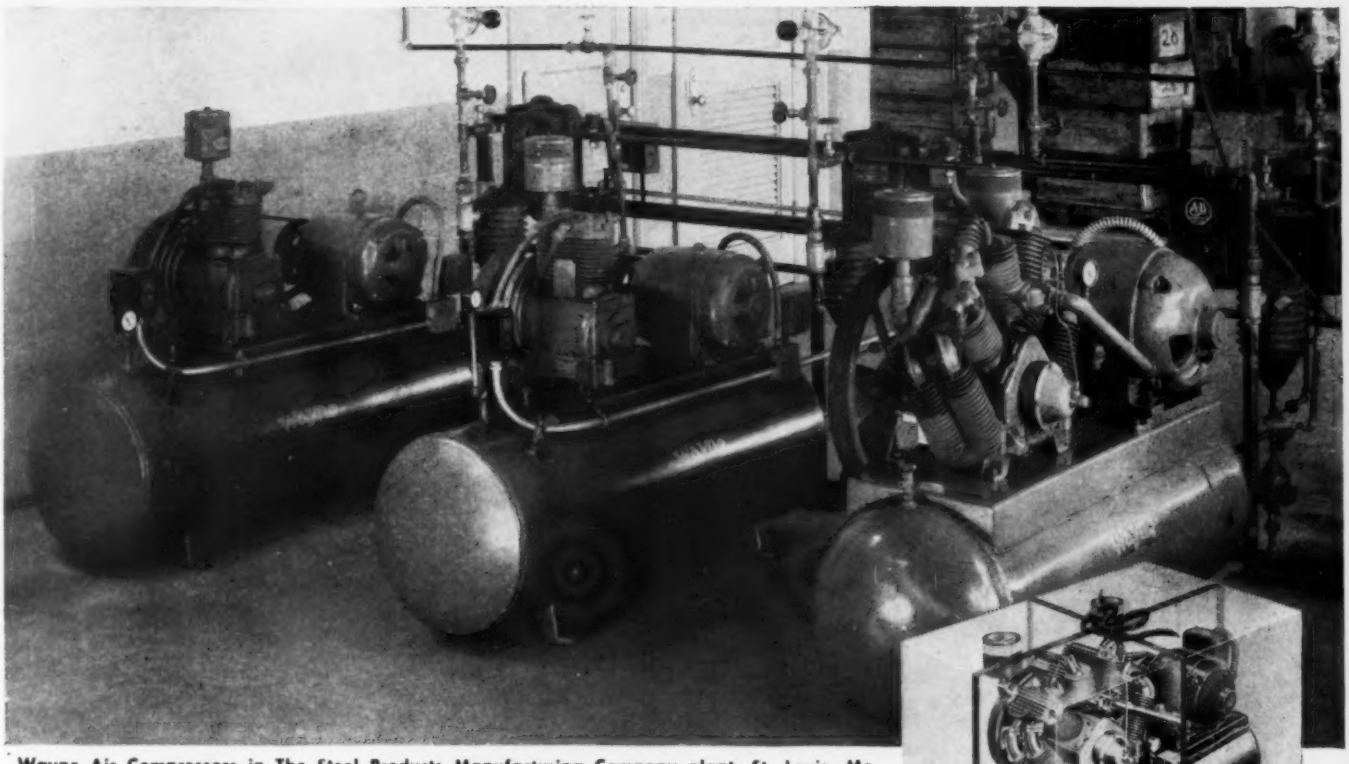
DUO-TEMP fully mechanical dial type indoor-outdoor thermometer is encased in smoothly contoured molded plastic in a neutral color which blends with any color scheme. On the dial, gold characters stand out in contrast to deep dubonnet background. Speedometer-type pointers indicate temperature readings. Strong molded crystal protects dial, and is curved to prevent reflection of light. *Jas. P. Marsh Corp., Dept. G-1, Skokie, Ill.*

FLOOR MAINTENANCE MACHINES

ILLUSTRATED are two Ace "Floor Savers", Model S for scrubbing, waxing and polishing, and Model T, for scrubbing and shampooing. Both models are fully guaranteed for one year against all mechanical and electrical defects. Extra power for rugged motor, combined with proper balance, is said to provide ease of handling. The machines are described as durable and of beautiful design. *The Ace Company, 112 W. Washington St., Ocala, Fla.*

SEE CLASSIFIED SECTION
PAGE 360

"NEVER WITHOUT AIR"



Wayne Air Compressors in The Steel Products Manufacturing Company plant, St. Louis, Mo.

Decentralize

AIR SUPPLY FOR SAFETY

INSURE continued production without danger of interruption due to lack of air by departmentalizing air supply in your plant. Install a Wayne in each department using air. These units will pay for themselves quickly, by eliminating wasteful operation of the large central compressor when only one or two departments work overtime.

No time is lost waiting because another department is using air. If air requirements are different in different departments, each Wayne unit can be set to provide the pressure needed. There are many other money saving advantages which a Wayne representative will gladly explain to you. Investigate Wayne Industrial Air Compressors now.

Investigate

THE WAYNE AUXILIARY UNIT PLAN!

THE WAYNE PUMP COMPANY · FORT WAYNE 4, INDIANA
517 Tecumseh Street

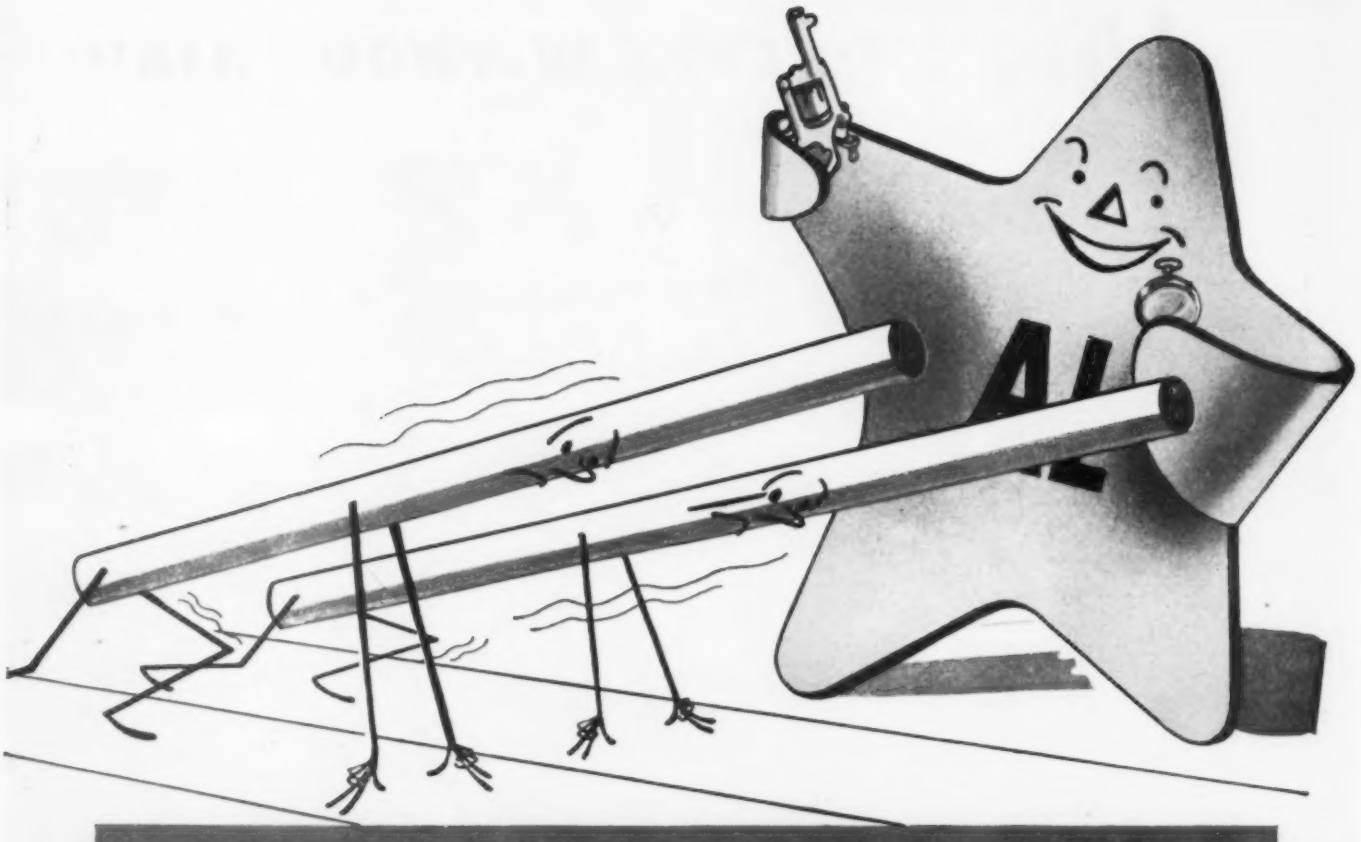
Please tell us more about Wayne Air Compressors and send booklet, "The Wayne Auxiliary Unit Plan." No obligation.

NAME _____ ADDRESS _____

CITY _____ STATE _____

WAYNE NATIONWIDE SERVICE

HOISTS • LOADING DOCK LIFTS • HOSE REELS • POWER WASHERS



Why start a PRODUCTION RACE with Drill Rod that's already over-worked?

Get *your* copy of our new book on

"CUTTING TOOL MATERIALS"

Every production man can use this 32-page book to advantage—it gives a complete and clear comparison of the characteristics and best uses of all types of Cutting Materials. *Write for your copy.*

ADDRESS Dept. P-72

Now you can get High Speed Drill Rod in the smaller sizes that is *unspent*, full of stamina—capable of better performance and longer cutting life than ever before. Allegheny Ludlum has perfected a new special process of *hot-drawing* these small sizes—avoiding the frequent anneals necessary with repeated cold-draws down to size, accompanied by severe strains, and with each reheating taking some of the life out of the steel.

The result is High Speed Drill Rod that can show you maximum hardness, and something extra in toughness when hardened and tempered—a fine-grained steel with small, evenly distributed carbides that produce maximum cutting ability and tool life.

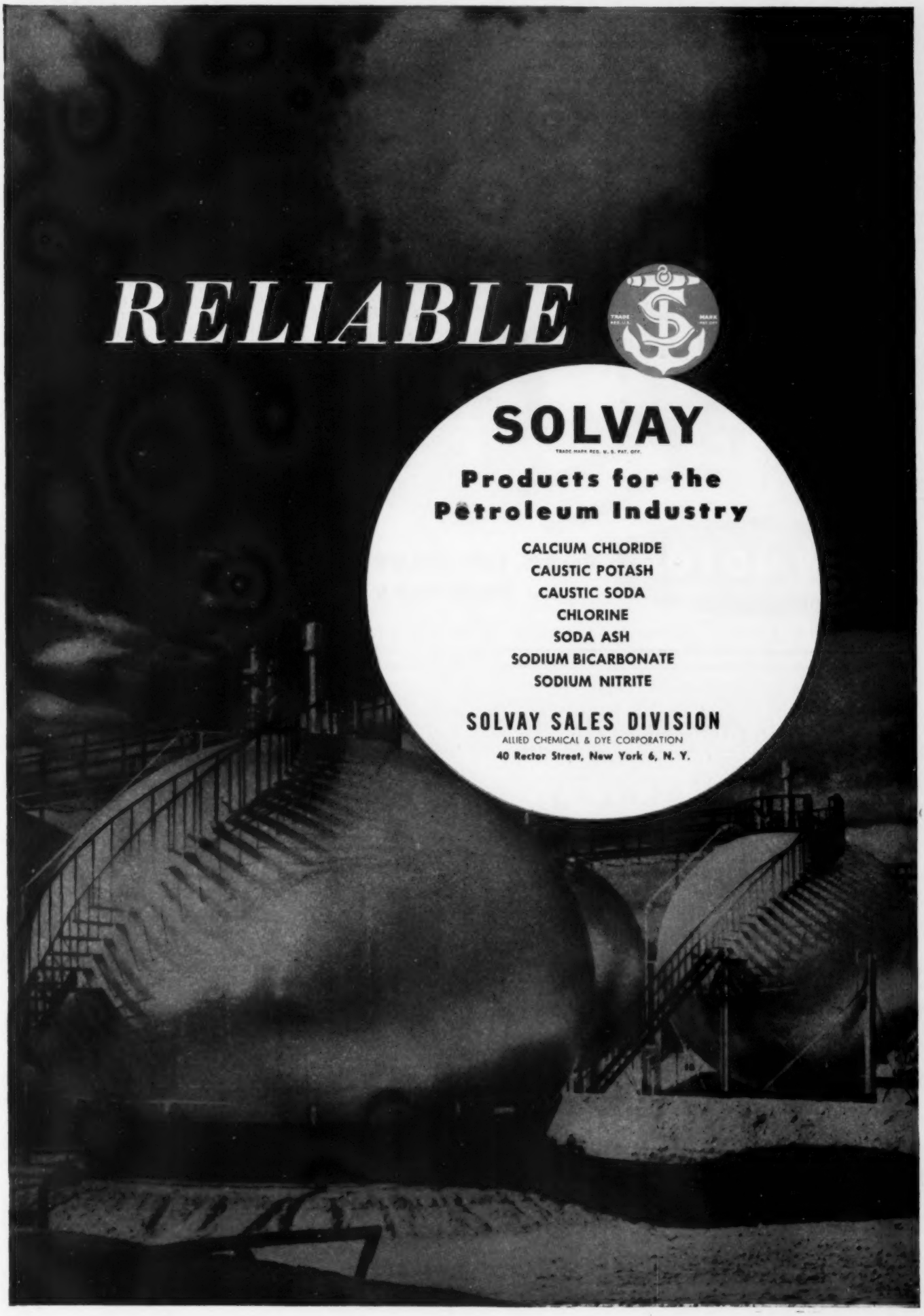
This product is available to you in the *grade* you're accustomed to using, too—all grades and types of High Speed Steels, as well as high carbon-high chrome Die Steel types. • Why not secure its advantages right away—get in touch with your local A-L representative or distributor.

ALLEGHENY LUDLUM STEEL CORPORATION
Pittsburgh, Pa.

TOOL STEEL DIVISION: DUNKIRK, N. Y.

Fine Tool Steels Since 1854

W&D 1777


RELIABLE
SOLVAY
TRADE MARK REG. U. S. PAT. OFF.
Products for the Petroleum Industry
CALCIUM CHLORIDE
CAUSTIC POTASH
CAUSTIC SODA
CHLORINE
SODA ASH
SODIUM BICARBONATE
SODIUM NITRITE
SOLVAY SALES DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Cut 20% to 30% from present production costs with Towmotor Mass Handling. That is the best way to increase profits today. Towmotor Fork Lift Trucks and Accessories rush raw materials to production lines and machines, speed finished products to shipping, stack full loads into overhead storage. Towmotor gives you full capacity, full speed, 24 hour operation. Ask to see the new Towmotor sound movie "The One-Man-Gang" in your office. Write Towmotor Corporation, Division 11, 1226 E. 152nd St., Cleveland 10, Ohio.

The Easiest Way to
INCREASE PROFITS
is to REDUCE COSTS with
TOWMOTOR
MH*

*"MH" is Mass HANDLING—the systematic movement of the most units, in the shortest time, at the lowest cost.

TOWMOTOR
THE ONE-MAN-GANG
FORK LIFT TRUCKS and TRACTORS

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

DUO-FAST
Take "The Labor" Out of Tacking
HAMMER TACKERS

DRIVE STAPLES FROM 5-32 TO 9-16" LONG
FEED AND DRIVE STAPLES AUTOMATICALLY
TACK 2 TO 4 STAPLES PER SECOND
EASY ONE HAND OPERATION

EASY TO LOAD
EASY TO CLEAN

FOR PRODUCTION WORK*—wherever the job calls for tacks, switch to Duo-Fast Automatic Tackers for fast, accurate and secure tacking. With Duo-Fast at work, you save time and money. FOR YOUR SHIPPING DEPT.—Duo-Fast Automatic Tackers provide the easiest and best method of tacking protective paddings, waterproof linings, and shipping tags. Write for Catalog on all Duo-Fast Automatic Tackers.

DUO-FAST
FASTENER CORPORATION
887 Fletcher Street — Chicago 14, Illinois

NON-EXTRUSION RING PACKING INTRODUCED

New ring packing which eliminates the damaging effect of extrusion of packing material into the clearance space between the mating parts is being introduced by Greene, Tweed & Co., North Wales, Pa. It is stated that the packing has proved itself applicable for diversified industrial use as seals in cylinders, swivel joints, struts, and numerous other applications including those where pressures are considerably above current practices. Applications cover all systems except those employing continuous rotary motion.

The packing may be used in any hydraulic or pneumatic system where a positive seal is necessary, and may be used in systems where the temperature range is from —70F to 250F and will not leak or fail over extended periods of operations with pressures anywhere from 0 to 3000 psi. Actual laboratory tests have been run at a pressure of 10,000 psi.

Palmetto G-T ring packing is supplied in two styles. One is the external or piston type seal and the other the internal or rod type seal. Bulletin TB-918 describes the packing in detail.

COLD WEATHER WELDING OF CRACKED MOTOR BLOCKS

New low heat electrode for welding cast iron motor blocks which may have cracked during cold weather sieges, known as Frigidarc coated Eutectrode 24/49, has been developed by Eutectic Welding Alloys Corporation, 40 Worth St., New York, N. Y. It is stated that the electrode may be used for on-the-spot repairs without any preheating or dismantling of equipment, cracks, breaks, wear and defective areas being easily repaired without loss of time. It is completely machinable through the weld and weld zone. The electrode is said to be as easy to use as a mild steel electrode on a-c or d-c, straight or reverse polarity.

CHART SHOWS HOW TO MAINTAIN AIR TOOL EFFICIENCY

Are you getting maximum production from your air-operated tools? Are you paying for air tool productivity, only to limit production capacity through the use of air hose of insufficient diameter? Did you know that a difference of 30 lbs. air pressure at the tool and a reduction of only ⅛-inch in air hose diameter can mean a loss of 65% in air power development?

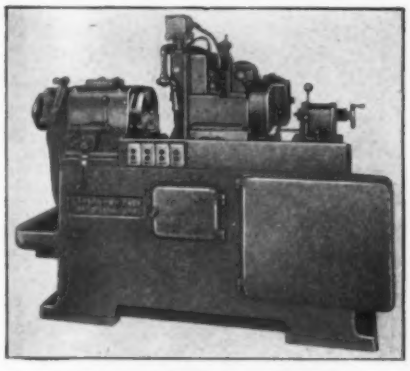
The answers to these and many other questions relating to air power development and air tool efficiency can be found, easily and quickly, by means of a new chart prepared by Buckeye Tools Corporation, Dayton 1, Ohio. The chart, compiled from the results of thousands of actual tests made under typical operating conditions, graphically points out the tremendous power loss, and consequent loss of air tool productivity, caused by the use of incorrect air hose and couplings.

(Please turn to page 192)

Hanson-Whitney Thread Grinder features Easier . . . Faster . . . More Wheel Dressings

Hanson-Whitney extends an invitation to you to *see* its new semi-automatic Thread Grinder at work. It is impossible, in restricted space, to explain the importance of this engineering achievement . . . to provide the necessary close-up photographs that bring out the many design innovations . . . nor can we show you the accuracy, the speed, the quality of production.

But we *can* arrange an appointment that we believe will interest anyone who needs a



STREAMLINED, COMPACT HANSON-WHITNEY THREAD GRINDER

better, faster method for grinding external threads from the solid on a production basis.

You will see a Master Roll that re-trues the Grinding Wheel for re-grinding the Crusher Roll in position, whenever its pattern has been worn by repeated crushing of the wheel. This means uninterrupted production for a long time . . . until the original Master Roll thread pattern itself becomes worn.

This is but one valuable feature of the new Thread Grinder. There are many more which combine to step up machine performance, lower operator fatigue, reduce rejects, and greatly improve the work.

If you are interested in rapid production thread grinding, we ask you to write us.

Maybe

THEY SHOULDN'T BE SO EXPENDABLE

It seems to be a foregone conclusion in many plants that taps in the screw machine sizes are *expected* to break . . . and *expected* to wear out . . . quickly.

Well, there's a big difference in taps and also in the meaning of "quickly."

Here at Hanson-Whitney we know that taps are expendable to a degree . . . but the degree depends upon many factors such as tap selection, type of operation, work material and lubrication.

If you are having troubles with tap breakage and tap wear we suggest that you do two things, 1) Write for our engineering suggestions, 2) Specify Hanson-Whitney taps . . . finished after hardening. There are no finer taps made.

HANSON-WHITNEY MACHINE CO. HARTFORD 2, CONN.
Division of Whitney-Hanson Industries, Inc.

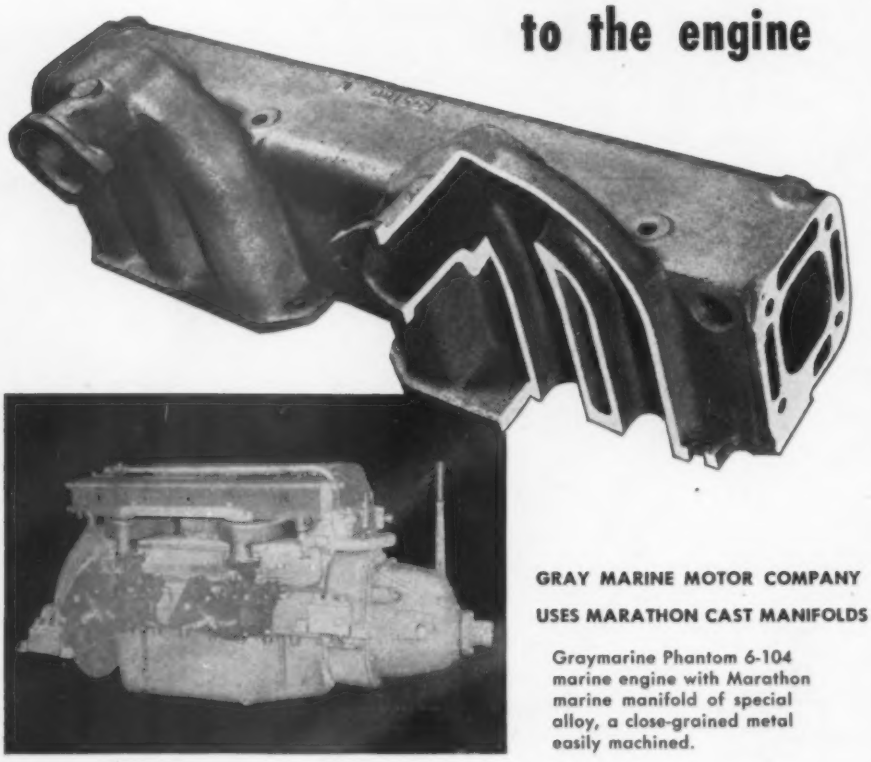
For practical recommendations submit your problems to Hanson-Whitney engineers.

Hanson Whitney

PIONEERS OF FINISHED TAPS

MARATHON

Gives complete casting & machining service . . . from the drawing board to the engine



GRAY MARINE MOTOR COMPANY USES MARATHON CAST MANIFOLDS

Graymarine Phantom 6-104 marine engine with Marathon marine manifold of special alloy, a close-grained metal easily machined.

Planning, designing and producing quality castings is our business.

Automotive engineers have found the experience and cooperation of Marathon engineering service invaluable in developing finely cast heads and manifolds to meet the most exacting specifications.

Our customers include many of the top-notch names in the diesel, automotive and marine field. Find out what Marathon engineering service can mean to you. Write or call us today.

MFM MARATHON FOUNDRY and MACHINE CO.

Wausau, Wisconsin

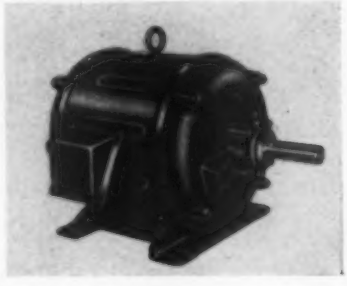
SOUND-COLOR PICTURE "STEAM FOR POWER"

New 16 millimeter sound-color film "Steam for Power", which depicts the development and application of modern steam boilers, has just been released by the Babcock & Wilcox Company, 85 Liberty Street, New York, N. Y. It is available free of charge to groups interested in power generation and utilization.

Making extensive use of both animation and photography, the film traces the history of steam utilization, showing early ideas in the use of steam for power as Hero's engine, Branca's turbine and Savery's pumps; reviews steps in the development of modern boilers, and the application and function of super-heaters, economizers, air heater, reheaters; pulverized coal firing, etc., and the concluding sequences show the erection of a large radiant boiler in one of the country's outstanding power stations.

WAGNER MOTORS IN LARGER DIP-PROOF DESIGN

The Wagner Electric Corporation, St. Louis, Mo., which has built dip-proof motors in frames 225 and smaller for many years, has adopted the same design for its polyphase motors in the 254, 284, 324 and 326 frames. The motor frames of the new design are almost exactly



5-hp ball bearing motor in the 254 frame

like those of their prototypes, differing only in the omission of all ventilating openings. They are formed of heavy rolled steel shaped to accurately center the stator core and to provide passages between the frame and the core for ventilation. An auxiliary fan, larger in diameter than the armature of the motor draws in air through the openings in the front endplate, forces it through these passages and out through the endplate openings on the drive end. Screens on the endplate openings prevent rags, paper or similar articles from being drawn into the motor. Both sleeve-bearing and ball-bearing motors of the new design are completely drip-proof when mounted in the normal horizontal position, and, when the endplates have been correctly rotated, these motors are still drip-proof in the sidewall or ceiling horizontal positions because they have no openings in the frames.

(*Please turn to page* 198)

Life-Line

NOW... LUBRICATED for LIFE

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

do away with lubrication costs

FOREVER

Forget old-time ideas about the care and greasing needed to keep motors running!

Life-Line motors now eliminate the time and cost required for lubrication—for life! Life-Line double-width ball bearings are prelubricated with a more-than-ample supply of specially-treated lubricant—and factory-sealed to keep dirt out and grease in, for *the life of the bearing.*

Periodic weekly or monthly greasing schedules can be dispensed with. Motors may be installed in inaccessible locations; machines no longer need be disassembled to reach motors for greasing. Winding failures caused by overlubrication, and failures caused by use of improper lubricants, can be prevented.

Multiply these advantages by the number of motors in *your* plant. You'll find they offer new and important savings—in labor costs, in machine down-time, in motor outage costs. Then get in touch with your nearest Westinghouse office today. Most standard Life-Line motors are now available from stock. Others are available on short delivery schedules. Ask for details on your requirements. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

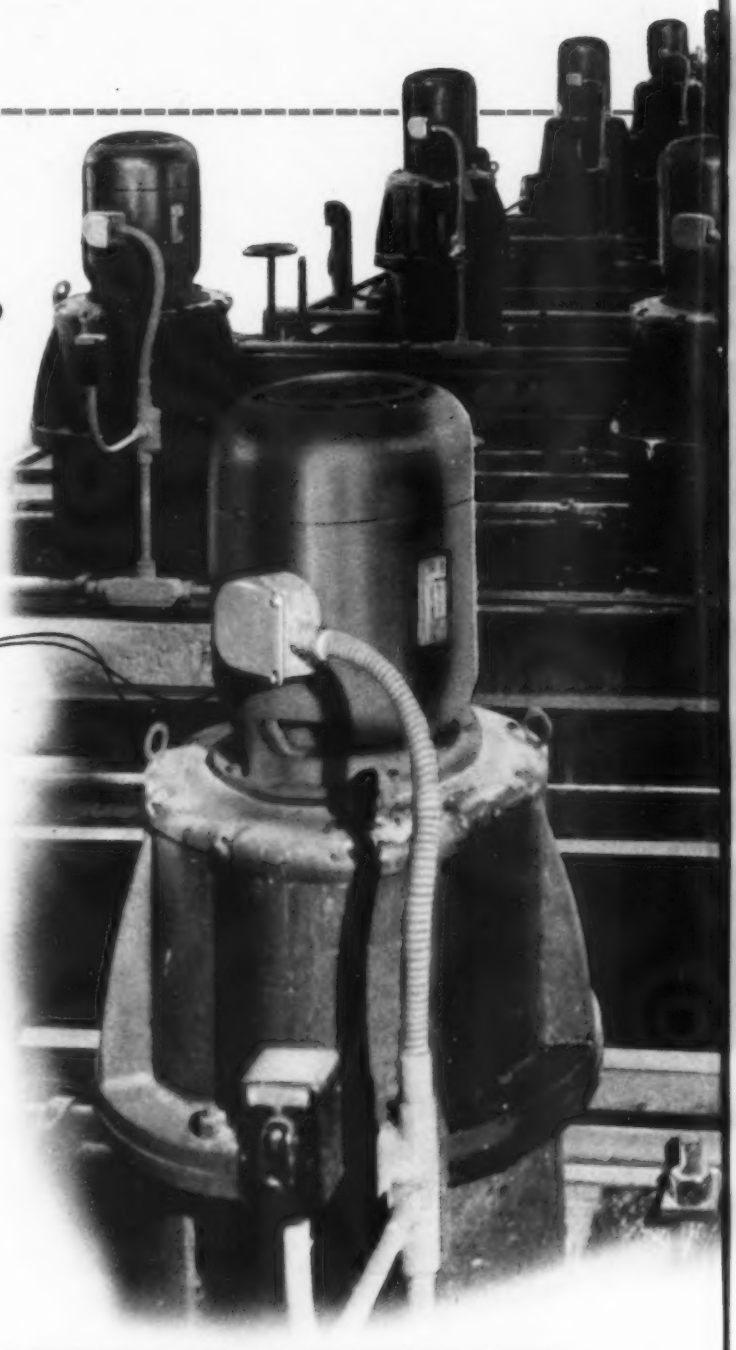
Westinghouse *Life-Line* Motors

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

Tough lubrication job?

NOT WITH MOTORS



LUBRICATED for LIFE

It costs money to "baby" electric motors with constant greasing attention, whether it's a few or a few hundred.

That's why Life-Line motors offer new and important savings in plants like this one using 119 Life-Line vertical motor drives, and in any others using a-c motors from 1 to 50 horsepower.

Life-Line motors cut down operating costs every day, every week, they are in service, because they need *no* lubrication—*for life.* Sealed, pre-lubricated bearings insure long life—reduce motor outages caused by overlubrication and underlubrication—reduce machine shutdowns and lost production.

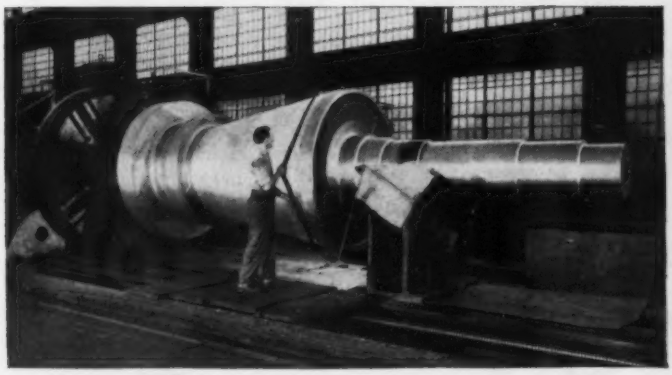
Check your Westinghouse representative today for prices and delivery on your requirements. Standard ratings available from stock—others on short delivery. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-21494

Westinghouse

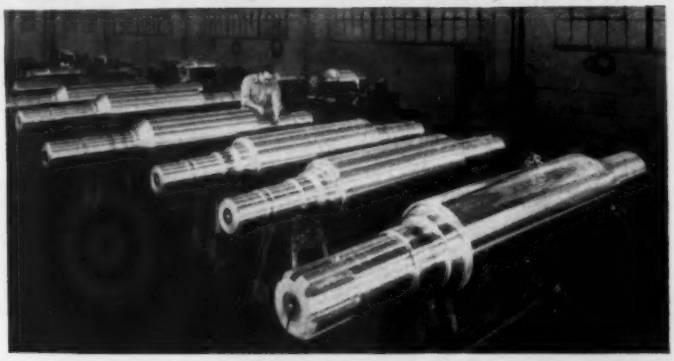
Life-Line

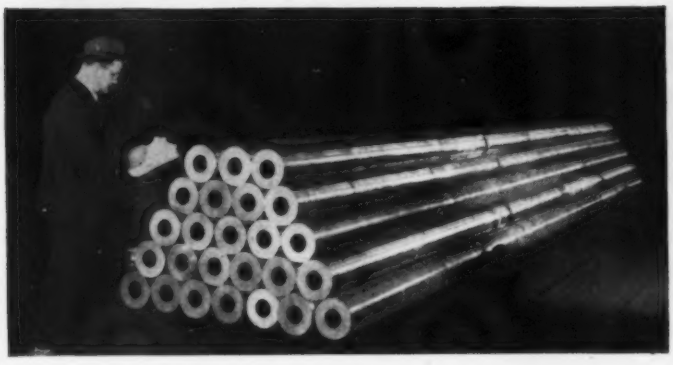
Motors

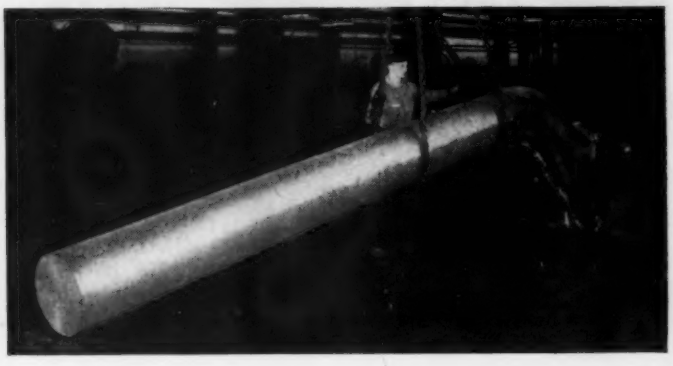
Litho in U. S. A



FORGINGS by BETHLEHEM



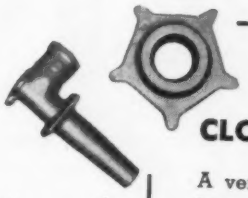




No one page could possibly be big enough to show you all the types of steel forgings that Bethlehem makes yearly. They range in size from whopping giants of many tons to midgets weighing a pound or less. And there is almost every size in between.

This requires extensive facilities, and Bethlehem has them: presses, hammers, upsetters . . . modern heat-treating equipment . . . large, well-equipped machine shops . . . careful inspection service. All work is expertly checked, step by step, from the making of the steel to the shipping of the finished product.

An order placed with Bethlehem is in competent hands. Whatever your requirements as to size or type, we are ready for you.



IN THE MARKET FOR CLOSED-DIE FORGINGS?

A very important part of Bethlehem's tonnage is its output of drop, mechanical-press, and upsetter forgings. These are made in hundreds of designs for a wide variety of industries.

We are equipped with batteries of steam and board drop hammers, 1500 to 8000 lb; mechanical presses to 2000 tons; and upsetters 9 in. and smaller. Work of this character is subject to the same strict controls and metallurgical supervision as the larger forgings.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

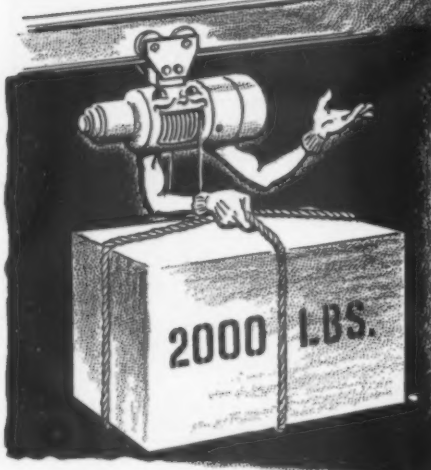
★ BETHLEHEM STEEL ★

Want Additional Product Information? See Page 19.

CAN YOU GUESS THE ANSWERS?

WHAT 'STRIPPER" WORKS IN OVERALLS?

IN MANY PARTS OF THE COUNTRY A "STRIPPER" IS NOT A BURLESQUE QUEEN, BUT A COAL MINER IN A "STRIP MINE." "STRIP MINING" REQUIRES QUANTITIES OF LAY-SET PREFORMED WIRE ROPE, MADE BY ACCO'S HAZARD WIRE ROPE DIVISION.



WHAT MACHINE LIFTS 18 TIMES ITS WEIGHT?

WEIGHING ONLY 107 POUNDS, A WRIGHT SPEEDWAY ELECTRIC HOIST WILL LIFT A TON AT THE TOUCH OF A BUTTON. MADE BY ACCO'S WRIGHT HOIST DIVISION.

HOW COULD WATER BOIL AT 32°F?

WATER BOILS AT 32° FAHRENHEIT IN A PERFECT VACUUM. ACTUALLY, IT WILL BOIL AT RELATIVELY LOW TEMPERATURES IN A PARTIAL VACUUM. WATER BOILS AT 212°F ONLY AT 30" BAROMETRIC PRESSURE. ACCO'S HELICOID GAGE DIVISION MAKES GAGES THAT ACCURATELY MEASURE VACUUM AS WELL AS PRESSURE.

ACCO Products Include: *AMERICAN Chain • TRU-LAY and LAY-SET Preformed Wire Rope • TRU-LAY Cable and TRU-LOC Swaged Terminals for Aircraft • TRU-STOP Emergency Brakes • PAGE Wire, Chain Link Fence and Welding Rods • CAMPBELL Abrasive Cutters . READING-PRATT & CADY Valves and Fittings • READING Steel Castings • PENNSYLVANIA Lawn Mowers • MARYLAND Bolts & Nuts • "ROCKWELL" Hardness Testers • WRIGHT and FORD Hoists • HELICOID Pressure Gauges • MANLEY Automotive Service Equipment • OWEN Silent Springs.*

ACCO

TRADE MARK

AMERICAN CHAIN & CABLE BRIDGEPORT CONNECTICUT

NEW CRANE LAVATORIES FOR INDUSTRIAL AND COMMERCIAL BUILDINGS

Crane Co., Chicago, has designed two new lavatories, the *Lavalux* and the *Sanicor*, for use in industrial and commercial buildings, in schools and institutions, in hotels, and in other buildings where it is important that water be automatically shut off when not in use. Both are of easy-to-clean vitreous china, and controls are designed so that users can wash in running water without the necessity of filling a basin that may have been soiled by a previous user. A foot pedal controls the flow of water, and a hand valve mounted on the top shelf of the lavatory makes it possible to adjust the warmth of the running water to the most comfortable temperature. This is a distinct advantage over the conventional type of automatic-shutoff hand-operated faucet, which makes it necessary to run water into the basin or to hold open either the hot or cold control with one hand while washing the other hand.

Water is supplied through a single spout. The spout is equipped with a spray to prevent splashing when water is running. A pop-up plug, with operating handle at the back of the spout, is provided for filling the basin when necessary.

The Lavalux is a flat-back lavatory for wall mounting. Its overall dimensions are 18x15 inches. The Sanicor is a space-saving corner lavatory, 17x17 inches overall. Both are available either in white or in a variety of colors. The photographs show the first installations of these new lavatories, on the new Pere Marquette coach streamliner, the "Chessie", now operating between Chicago and Grand Rapids.

MANUAL ON HEAT SEAL PAPERS

Third and latest edition of its Technical Manual, Nashua's Heat Seal Papers, on the subject of dry labeling, taping, and wrapping with heat instead of moisture, is now available from the Nashua Gummed and Coated Paper Company, Nashua, N. H. Among the advantages claimed for the heat seal papers are elimination of the use of water and glue, high production speeds, adaptability to a variety of surfaces, elimination of odors, mold resistance, and permitting of stop and go production. Copy of the manual is available for the asking.

(*Please turn to page* 200)

Specify Thermoid

V-Belt Section

Thorough impregnation of rubber between the cords prevents internal friction.

Thermoid Impregnation Process* Assures Longer V-Belt Life

Thermoid V-Belts are built for the job!

Thermoid V-Belts resist moisture-absorption, and both *internal* and *external* abrasion. Internal abrasion of the cotton cords weakens V-Belts, causing stretch and wear. The Thermoid Impregnation Process assures longer belt life by eliminating internal friction and reducing heat. *And Thermoid V-Belts are pre-stretched to insure perfect operation.*

There are Thermoid V-Belts available to meet *your* requirements.

Your nearest distributor has most sizes in stock for immediate delivery. Through close cooperation with Thermoid field representatives, he can offer quick service on your special V-Belt problems. It will pay you to ***Specify*** Thermoid!

Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.

Thermoid Company

Main Offices and Factory · Trenton, N. J., U. S. A.

Western Offices and Factory · Nephi, Utah, U. S. A.

Industrial Rubber Products

Friction Materials · Oil Field Products

*Thermoid Impregnation Process

The Thermoid Impregnation Process insures a deeper penetration of rubber between the threads of the yarn, which encases each individual strand with protective rubber. The rubber acts as a sheath between the strands and prevents the destructive abrasion action as the product is flexed in use. To obtain the required rubber penetration, the twist of the yarn must be to exact specifications. With the yarn twisted too tightly, proper penetration of the rubber compound is impossible. This condition produces abrasion, causing premature failure. On the other hand, if the yarn is twisted too loosely, the product lacks tensile strength. Thermoid has discovered the optimum twist of the yarn which assures maximum rubber penetration and greatest strength. The development of Thermoid Impregnation Process is another step forward in Thermoid's planned program of product improvement, assuring maximum service and lower operating costs to industry through the use of Thermoid Industrial Rubber Products.

SHELVING ROLLS ON TRACKS 50% FLOOR SPACE SAVING

Metal cabinets, shelving and lockers which roll on tracks, and which can be so compactly placed that upwards of 50% of floor space is saved without affecting accessibility, are announced by Acrow, Inc., 155 Washington St., Newark, N. J. This new system of "storage on wheels" is known as the Foulkes Rolstore Mobile Storage system. The tiers of shelving, or cabinets are easily shunted along the

"Storage on Wheels". The shelves or cabinets are readily shunted back and forth to provide access to those in rear.

tracks, giving ready accessibility to the back rows or specific sections. In addition to space saving, the system is also claimed to make for about 20% saving in walking distance. It is adaptable to storerooms, filing rooms, or any use where there is need for large amount of shelving, storage cabinets, bins, files, etc.

FORMICA
at Work in Industry
Can you name an Industry not using Formica Parts?
The list of Formica Parts users reads like a Directory of World-wide Industry. Tell us what you need and Formica will produce your parts to your specifications. Typical examples:
1 Tubing Used in Rayon Manufacturing Machines.
2 One-piece Bobbins . . . Textile Industries.
3 Flexible Couplings for Motor Drives.
4 Automotive Distributor Breaker Arms.
5 Bus Bar Insulators . . . Electrical Mfg.
Productive FORMICA at Work in Industry
Let us know how you are considering using Formica. Typical sample parts and "Data on Formica" are available. Help us help you. Write FORMICA, 4517 Spring Grove Avenue, Cincinnati 32, Ohio.
Data on Formica
1
2
3
4
5

NEW SIZE LIMITS IN NON-FERROUS PIPES, TUBES

As a result of continued research and experiments with war time equipment, it is now possible to produce seamless tubes and pipes in sizes more than double those available before the war, it was announced by James F. McNamara, vice-president of The International Nickel Company, Inc.

Mr. McNamara said that a 4000-ton extrusion press, installed at Inco's Huntington Works during the war and used largely for the production of rotating shell bands, is now producing pipe in nickel, Monel and other high nickel alloys in diameters up to 9¼ inches and in lengths up to 12 feet.

"These shapes can be further cold drawn into seamless pipe 8 inches in diameter, wall thicknesses up to ¾ of an inch, and in varying lengths," he said.

"Prior to the war, the largest size available in pipe and tubing of nickel and the high nickel alloys was 5 inches in diameter. Since the end of the war, we have been endeavoring to increase the size ranges up to the present limits.

"While large piping and tubing in the Inco nickel alloys have been available in centrifugally cast or welded form, this is the first time they have been made in these sizes by forging, extruding, and cold drawing into seamless form.

(*Please turn to page* 202)

SINCERITY

has proved both a fault and a virtue

Also available in Glass

Sincerity in upholding the policy of highest quality and the claims of superiority, has interfered with meeting the constantly increasing demand for GITS Visible Oilers in a limited way.

NOW —

—reconversion, standardization and improved facilities, plus the engineering "know-how" of more than 40 years in both war and peacetime development of lubricating devices, gives you Genuine GITS Visible Oilers in both *the highest quality* and in *any desired quantity*.

GITS Visible Oilers are featured in Wick Feed, Vibrating Rod, Constant Level, Sight Gravity Feed and unmodified transparent bottle types.

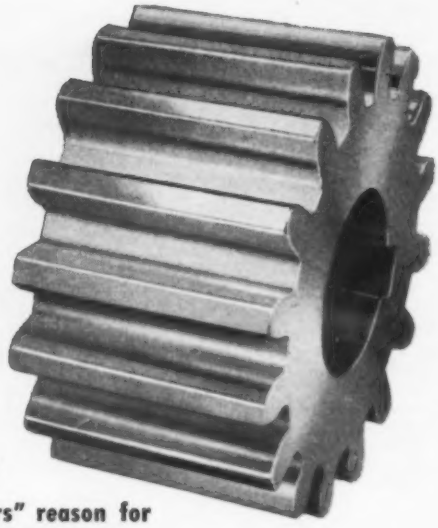
GITS has been "Friction-Fighting Headquarters" for more than 40 years and always will be— bring your problems to GITS.

Write for information

GITS BROS. MFG. CO.

1865 S. Kilbourn Ave., Chicago 23, Illinois

Ampco Bronze Gears

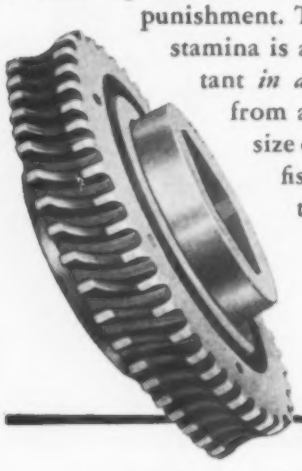


last longer, cut replacement costs

. . . a "common-sense and dollars" reason for making all your gears from Ampco Bronze alloys

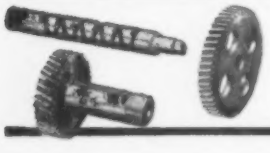
You can count on Ampco Bronze to stand up under the most brutal punishment. This extra stamina is all-important *in any gear*—from a thimble-size drive for a fishing reel to the rolling-mill gear which is illustrated below.

Whether you are designing a new gear or rebuilding old equipment, play safe by selecting the Ampco alloy and form that fit your needs. Get a gear that stands up under impact and fatigue with unbelievable resistance to wear—that outlasts any gear on the same job. Ask your nearest Ampco Field Engineer for recommendations and assistance.



SAND-CAST AMPCO METAL—Massive 2416 lb. worm gear which plays a critical part in the "screw-down" mechanism of a giant size rolling mill.

CENTRIFUGAL CASTING (including teeth)—Used as a boom hoist gear on large excavating shovel. Withstands wear, fatigue, shock, and abrasion caused by dust, dirt, and loading.



EXTRUDED AMPCO METAL—Tiny drive-gears and level-wind gears for a fishing reel; designed to give perfect performance and service under widely varied conditions.

WELDED ASSEMBLY — An Ampco centrifugally-cast ring welded to a mild steel hub and web with Ampco-Trode 10.

***CONTINUOUS-CAST AMPCOLOY—Bronze rim with die cast aluminum hub and web. This eccentric gear is proving its value by giving long, satisfactory service in many automatic home washers—and at a savings to the manufacturer.**

***Produced by American Smelting and Refining Co. under a patented process.**

Ampco Metal, Inc.

Dept. P-2 • Milwaukee 4, Wisconsin

Field offices in principal cities. G-1A

Detailed information on Ampco Metal and Ampco Bronze alloys

TEAR OUT THIS COUPON AND MAIL TODAY!

Please send me a free copy of your Bulletin 95.

Name ..... **Position**.....

Company.....

Street Address.....

City.....( ) **State**.....

COPPER ALLOY SPECIFICATIONS INDEX

A new, up-to-date edition of "Copper and Copper Alloy Specification Index", which is available without charge, is announced by the American Brass Co., Waterbury 88, Conn. It is known as Publication B-34, Second Edition. The first edition published a year ago, has proved a time-saving convenience for those using standard specifications of engineering societies and Government agencies.

In two sections, the first part lists Anaconda's most generally used alloys, together with all applicable specifications. Section II lists specifications in numerical order with a brief description of materials covered as to grade, type, temper, anneal, etc. Both sections are side-indexed for ready reference.

HIGH SPEED PHOTO-ELECTRONIC COUNTER

For industrial applications in which mechanical counters do not count accurately, or wear rapidly because of counting speed, the Potter Instrument Co., 136 Roosevelt Ave., Flushing, N. Y., announces new Model 310 Photo-Electronic Counter which can be used at counting rates up to 6000 per minute. Small objects as well as closely spaced parts can be accurately counted since the width of the beam is only ¼-inch and responds to light changes as small as 25 percent. For counting shaft rotations without physical contact the company also has available the model 311 electronic counter for use with an electro-magnetic pickup coil.

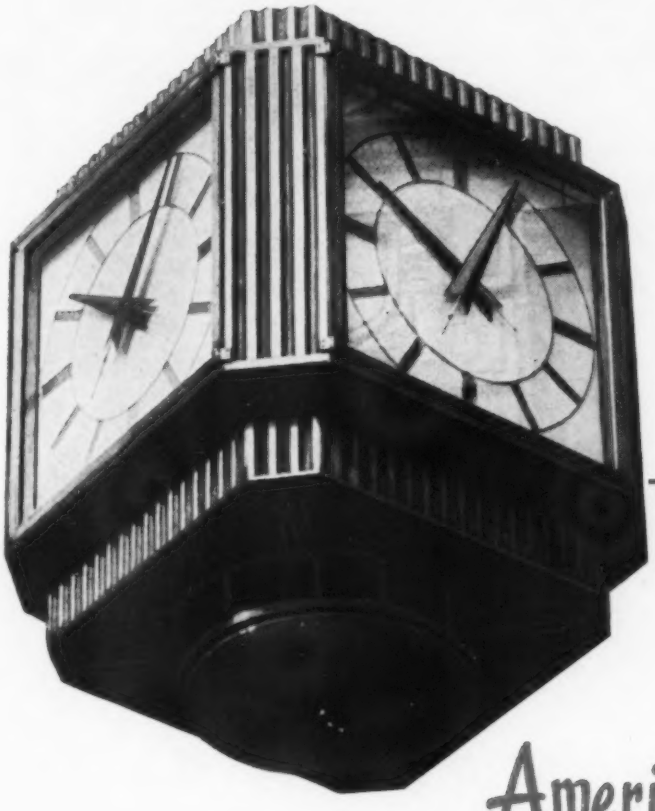
Counter can be used at counting rates up to 6000 per minute.

DESIGN FOR WELDING

A significant record of the progress of arc welding during the post-war years is contained in the new book "Design for Welding", published by the James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio. The book is composed of abstracts of 82 award papers in the Foundation "Design for Progress" award program. Over 1000 pages, 5½" x 7½", profusely illustrated with photographs, drawings, tables and cost data; bound in semi-flexible simulated leather covers, the book is priced at $2.00, postage prepaid in the United States; $2.50 elsewhere.

(*Please turn to page* 206)

...in this small, mass-produced alarm clock



...in this huge, custom-tailored building clock

American Quality Springs

help tick off the time accurately!

TIMEPIECES are among the best (and toughest!) "proving grounds" that springs can have. Any flaws in spring materials—any failures to meet design specifications, are quickly detected.

In mass-produced alarm clocks—in the custom-made clocks, American Quality Springs are giving excellent performance.

In hundreds of other products, covering all kinds of operating conditions, American Quality Springs have earned a reputation for outstanding performance *and longer life.*

Here's why . . .

Our spring engineers carefully analyze the basic spring design factors of load, deflection, and space. Then they use those factors to determine the stress, spring diameter, wire size, material, rate, solid height and free length.

Our vibration engineers have complete equipment for testing all types of springs in fatigue and under the dynamic conditions to which they may be subjected.

Our metallurgical engineers have kept pace with steel and wire making developments. This insures our customers the best type and quality of wire for each specific job.

Further, we don't furnish customers with springs that are "overpowered." In other words, we don't recommend stainless steel or special alloy steels when ordinary carbon steels would do the job.

So regardless of the type of spring you need, why not get in touch with us? We would appreciate a sample, sketch or blueprint of the spring you are now using when you submit any inquiries.

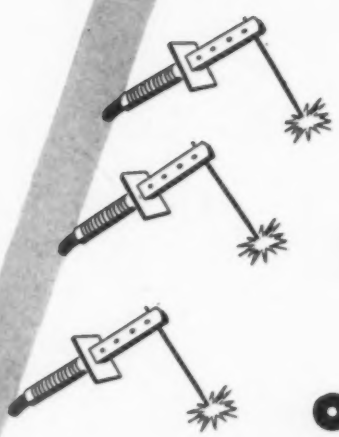
AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL SUPPLY COMPANY, NEW YORK

USS **AMERICAN QUALITY SPRINGS**

UNITED STATES STEEL

Want Additional Product Information? See Page 19.

if



You Weld

MONEL...

MONEL CLAD

or

OVERLAY *with* MONEL

try the new improved

ARCOS MONEND 806

ARC WELDING ELECTRODE

CONSIDER THESE UNUSUAL PROPERTIES

- **X RAY QUALITY WELD METAL**
- **TYPICAL WELD METAL AS WELDED**

Yield Strength	*42,500 psi.*
Tensile Strength	*75,500 psi.*
Elongation in 2"	*42%*
Reduction of Area	*60%*

- **MONEL CLAD (½"—20% CLAD)**
  Typical Free Bend Elongation—53.7%
- **OVERLAY (¾" MILD STEEL BASE)**
  Typical Free Bend Elongation—51.5%

SEND FOR FREE SAMPLES

Address your inquiries to Dept. S.

—An amazing combination of advantages in favor of non-ferrous and stainless steel bolt and nut products—advantages which make your product stand up and perform better under adverse conditions—advantages in greater service, disassembly or adjustment—and all at a cost only slightly more than common steel.

6000 INDIVIDUAL ITEMS IN STOCK

The widest assortment of bolts, nuts, screws, washers, rivets, and accessories in Brass, Bronzes, Copper, Monel and Stainless Steels available from one source . . . large quantities of each. Specials made to order from ample stocks of raw materials.

WRITE TO GENERAL OFFICES, DEPT. F, FOR OUR 134 PAGE COLOR CATALOG giving blue print drawings, dimensions, threads, heads and sizes of each item. Special Stainless Steel Catalog also available upon request.

THE H. M. HARPER COMPANY

General Offices and Plant
MORTON GROVE, ILLINOIS
(Suburb of Chicago)
New York Office and Warehouse
NEW YORK 13, 200 HUDSON STREET

Branch Offices—Atlanta, Cambridge, Cincinnati, Cleveland, Dallas, Denver, Detroit, Grand Rapids, Los Angeles, Milwaukee, Philadelphia, St. Louis, San Francisco, Seattle, Toronto (Canada)

Want Additional Product Information? See Page 19.

BUSINESS IN MOTION

To our Colleagues in American Business . . .

Perhaps it is because orders, particularly repeat orders, are definite proofs of satisfaction that comparatively few buyers take the trouble to give any other expression of their esteem. As a rule, some unexpected or special quality or service is required to draw forth compliments in writing. Hence Revere was exceptionally pleased to receive the following letter:

"As you may know, we have duplicate dies with several firms for reasons that are obvious. However, we recently ran an experimental time study on two batches of identical goods from your firm and from another source. The results will amaze you.

"We have found that for uniform quality and excellence of raw finish your extrusions stand head and shoulder above all other sources that we have had contact with since forming this corporation and with sources that the writer was familiar with before the war in the midwest.

"During the running of this study, we found that we could cut and color with a complex compound in a double pass on a pleated buff and produce a superior finish in a saving of up to one-half of the time it took us to produce a similar finish on the same item of the same alloy from another source.

"More important to us, however, was the fact that we find your materials to be much more consistent and that we do not find that 'batches' make the difference that they seem to with goods from other reputable sources.

"If this information and the technical data relating to it can ever be of value to you and your firm, please feel free to call upon us at any time."

This heart-warming letter assured us again that the infinite pains taken in our laboratories and mills to maintain standards and specifications are continuing to guarantee the customer satisfaction without which we could not have survived for 147 years.

However, our purpose in revealing this letter was not to pat ourselves on the back, but to point up what we have said so often in the past: that a successful relationship between buyer and seller depends upon a full interchange of information as to products and processes, successes as well as failures. No less than the compliment, the letter of complaint is also good business. A frank statement of the whys and wherefores of dissatisfaction supplies the information that makes corrective measures possible; without it, both parties may remain in the dark as to their real requirements and potentialities. Hence Revere suggests that no matter what you buy, nor from whom, brickbats are as essential as bouquets. Suppliers who know all the facts, good or bad, can always serve you better.

REVERE COPPER AND BRASS INCORPORATED
Founded by Paul Revere in 1801

☆ ☆ ☆

Executive Offices:
230 Park Avenue, New York 17, N. Y.

NEW WICKWIRE ROPE CATALOG

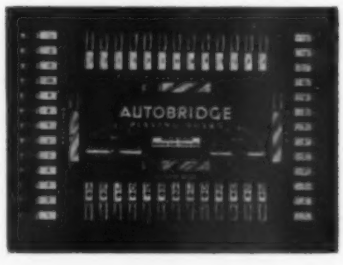
New Wickwire Rope catalog, marking the 50th anniversary (1898-1948) of wire rope making at the Wickwire rope mill at Palmer, Mass., offers a different approach to a difficult subject. New charts, tables, drawings and photographs are included which present a fresh slant on wire rope, and the text matter presents technical matter in a style understandable to the layman.

The catalog has three indexes which permit quick reference. The first section covers the characteristics of wire rope. The second has been divided into six parts, describing wire rope for specific industries. And the third section deals with the highly important subject—the care and handling of wire rope.

Copy of the new issue is available from The Colorado Fuel and Iron Corporation, Wickwire Spencer Steel Division, 500 Fifth Ave., New York 18, N. Y.

✓ ✓ ✓

SATIN BLACK FINISH



The purpose of this picture is to illustrate a new finish known as Adheron Satin Black, announced by the Duralac Chemical Corporation of 84 Lister Ave., Newark, N. J. The bridge board is made of aluminum. The finish can be used as a primer under nitrocellulose lacquer or under synthetic baked finishes, or it can be used as a satin or semi-gloss finish for aluminum and other nonferrous metals. Samples are available for test use.

✓ ✓ ✓

FLOW METER HANDBOOK

The accuracy of the center-line velocity and pipe-factor method of applying the Pitot tube, described in "Principles and Practice of Flow Meter Engineering", is confirmed by recent tests at the University of California, though it is pointed out by the author of the handbook, L. K. Spink, that to hold the expected error within plus or minus 3%, in addition to precautions recommended by the University engineers, the Pitot tube, unless of an approved laboratory design, should be individually calibrated. Pipe factors plotted in the handbook correspond closely to value given for 16" commercial iron pipe approximately 10 years old, or for newer pipe in the smaller sizes. Copies of the handbook are available from The Foxboro Co., Foxboro, Mass., at $3.00 per copy.

(*Please turn to* page 210)

How Two-Way Buying Makes Good Purchasing Agents *Better*

Good purchasing agents know there is a lot more to buying than price. They know that their first consideration always must be the protection of their company's product — the upholding of its quality and performance standards.

Symbol of better products and better-selling products wherever wheels and shafts turn.

When a purchasing agent buys consistently on this basis he is doing a good job. He can however, go one step farther; while helping to make the product a better product, he also can help to make it a *better-selling* product. He can do this by selecting parts and materials that not only are recognized as the best of their kind quality-wise, but that also are accepted and preferred by equipment users everywhere.

When buying is consummated on this two-way basis, price takes care of itself. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ↓ AND THRUST →← LOADS OR ANY COMBINATION ✳

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

ANOTHER *Reason to Buy*

WESTINGHOUSE INDUSTRIAL FIXTURES

The Heavy Duty Lampholder

Announcing . . . the new push-type, twin lamp holder that radically cuts maintenance costs . . . eliminates socket replacements. Available now in the Westinghouse fixtures shown at left . . . *and at no increase in fixture price.*

The new heavy-duty holder is designed to help you sell more fixtures and increase your profits on maintenance jobs. It cuts socket replacement by eliminating breakage and chipping. Lamps can be inserted quicker—easier, and they can't fall out. Starters are housed in the lamp holder—can be changed without removing lamps. Smooth, rounded, one-piece construction makes cleaning simple.

CUTS MAINTENANCE COSTS 6 WAYS

1. The all-steel housing provides indestructible protection for the lamp holder.

2. Spring-type socket at both ends of fixture makes lamp insertion quick and simple. Lamp is guided into position by a bevelled ring guide. Once inserted, the lamp can't fall out!

3. Spring pressure at both ends of the lamp provides a "floating ride" for the lamps—minimizing the effects of shock and vibration.

4. Starters are readily accessible and can be replaced without removing lamps. Arrow on socket housing indicates lamp operated by starter.

5. Sliding action of spring contacts provides self-cleaning contact with lamp pins. A safe, positive electrical contact is assured.

6. Lamp holder wiring contacts are so arranged that connections can be made without removing unit from the fixture.

Specify Westinghouse fixtures with the new heavy-duty lamp holders. Save yourself and your customers needless maintenance expense.

For further information about the new Westinghouse line of industrial luminaires featuring the heavy-duty lamp holder, write for booklet B-4194. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-04202

Westinghouse

PLANNED LIGHTING PAYS

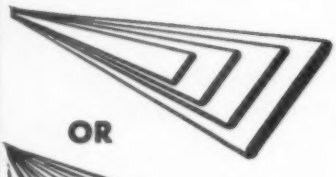
PAGE

Stainless Steel

WIRE

ROUND

FLAT



OR

SHAPED

Page for Wire—Especially Stainless

Remember that the next time you are looking for a responsible source for stainless steel wire. Wire has always been the business of PAGE. And PAGE has been working with stainless ever since its earliest development.

Whatever problem you may have involving wire—

Get in touch with Page!

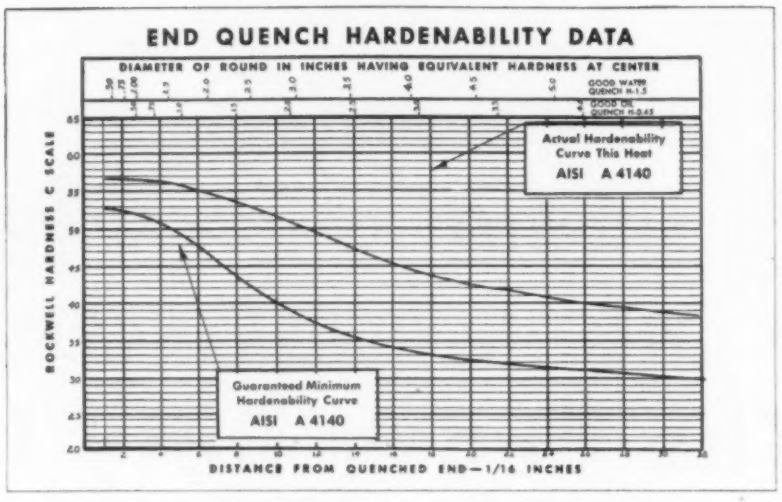
ACCO

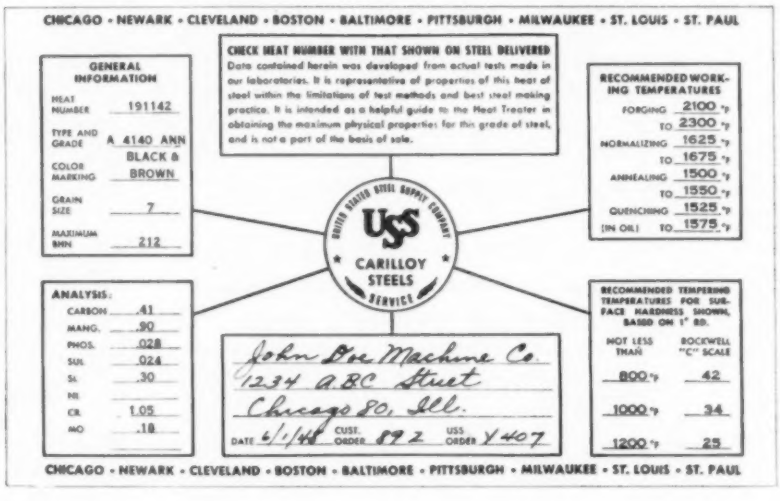
Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Pittsburgh, Philadelphia, Portland, San Francisco, Bridgeport, Conn.

PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

Heat Treating Guide Issued by U. S. Steel Supply Co.


END QUENCH HARDENABILITY DATA
DIAMETER OF ROUND IN INCHES HAVING EQUIVALENT HARDNESS AT CENTER
GOOD WATER QUENCH H-1.5
GOOD OIL QUENCH H-0.45
ROCKWELL HARDNESS C SCALE
Actual Hardenability Curve This Heat
AISI A 4140
Guaranteed Minimum Hardenability Curve
AISI A 4140
DISTANCE FROM QUENCHED END—1/16 INCHES


CHICAGO • NEWARK • CLEVELAND • BOSTON • BALTIMORE • PITTSBURGH • MILWAUKEE • ST. LOUIS • ST. PAUL
GENERAL INFORMATION
HEAT NUMBER 191142
TYPE AND GRADE A 4140 ANN
COLOR MARKING BLACK & BROWN
GRAIN SIZE 7
MAXIMUM BHN 212
CHECK HEAT NUMBER WITH THAT SHOWN ON STEEL DELIVERED
Data contained herein was developed from actual tests made in our laboratories. It is representative of properties of this heat of steel within the limitations of test methods and best steel making practice. It is intended as a helpful guide to the Heat Treater in obtaining the maximum physical properties for this grade of steel, and is not a part of the basis of sale.
RECOMMENDED WORKING TEMPERATURES
FORGING 2100 °F TO 2300 °F
NORMALIZING 1625 °F TO 1675 °F
ANNEALING 1500 °F TO 1550 °F
QUENCHING 1525 °F TO 1575 °F (IN OIL)
UNITED STATES STEEL SUPPLY COMPANY
USS
CARILLOY STEELS
SERVICE
ANALYSIS:
CARBON .41
MANG. .90
PHOS. .028
SUL .024
SI .30
NI
CR 1.05
MO .18
John Doe Machine Co
1234 ABC Street
Chicago 80, Ill.
DATE 6/1/48 CUST. ORDER 892 USS ORDER X407
RECOMMENDED TEMPERING TEMPERATURES FOR SURFACE HARDNESS SHOWN, BASED ON 1" RD.
NOT LESS THAN
ROCKWELL "C" SCALE
800 °F 42
1000 °F 34
1200 °F 25
CHICAGO • NEWARK • CLEVELAND • BOSTON • BALTIMORE • PITTSBURGH • MILWAUKEE • ST. LOUIS • ST. PAUL

A practical heat-treating guide, covering specific potential properties, accompanies each lot of alloy steel delivered from the far-flung service units of United States Steel Supply Company. In card form, so that it may be filed in its cellophane jacket after serving its shop purpose, each of these guides removes guesswork from operations—from forging to heat treatment—by informing the steel buyer on minimum hardenability, actual hardenability and other useful facts concerning the grades ordered from this warehousing subsidiary of United States Steel Corporation.

Specific Information Included

The heat treatment guide contains, in addition to general information describing the particular lot of steel it covers, data on the chemical composition, recommended working temperatures, physical properties, and end quench hardenability data. General information includes the heat number, which provides a positive means of identification and is a serial number assigned to each heat of steel manufactured. This number is marked directly on each bar 2 inches in diameter and larger, and is tagged to each bundle of bars smaller than 2 inches in diameter. The specification number indicates the general composition of the steel furnished. It may be followed by certain abbreviations which define the grade of steel; such as annealed, cold finished, cold finished and heat treated, and so on.

Each grade and condition of steel further is unmistakably identified with a color marking. Constant checking and double checking during each stage of manufacture of the steel, and during stocking and handling in the warehouse, assures the customer of obtaining the proper type of high quality alloy steel.

The card also shows a number indicating the actual austenitic grain size of the steel delivered to the customer. The maximum Brinell hardness number, determined by actual tests made on annealed alloy steels, is also indicated on the guide. The chemical composition stated on the card is obtained from actual chemical tests made periodically during the process of the manufacture of the steel.

All data contained on the heat treatment guide cards have been developed from actual tests made in laboratories. They are representative of properties of the particular heat of steel the guide covers, within the limitations of test methods and best steel making practice.

(*Please turn to page 212*)

STOP THE FIGHTING

between shafts and bearings!

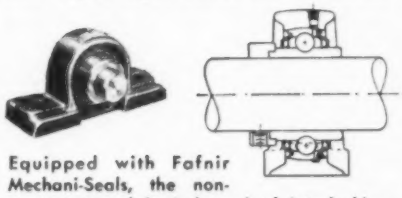
use FAFNIR PILLOW BLOCKS

equipped with the easy-on, easy-off Wide Inner Ring Bearing and the self-locking collar.

★ SINGLE PILLOW BLOCKS, self-aligning

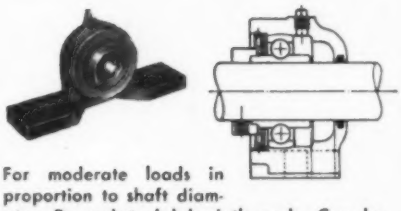
A compact design for fixed positions. Grease lubricated. Self-aligning . . . beveled outer ring and matching bevel on inside of housing.

LAK Type, Light Series



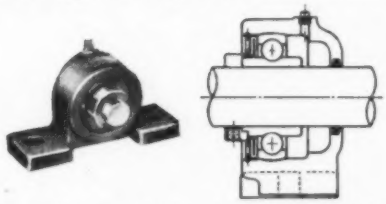
Equipped with Fafnir Mechani-Seals, the non-contact type labyrinth seal of interlocking steel plates. Traps in lubricant and locks out dirt and moisture.

SA Type, Standard Series



For moderate loads in proportion to shaft diameter. Pressed-steel labyrinth seals. Can be fitted with extra dust and dirt guards, front and rear, where extremely dirty conditions obtain. Side opposite collar can be closed.

SAO Type, Heavy Series

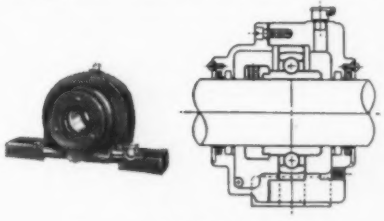


Uses a heavy series bearing to handle loads heavy in proportion to shaft diameter. Steel labyrinth seal. Special dust and dirt guards available when required by conditions. Side opposite collar can be closed.

★ SINGLE PILLOW BLOCKS, Floating Type

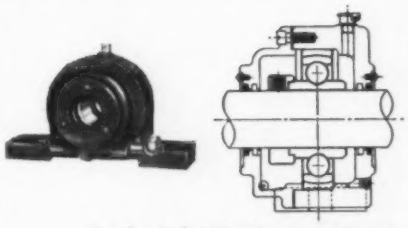
Where shaft temperatures exceed the normal, this oil lubricated design provides for shaft expansion by supplying pillow blocks in pairs, one fixed endwise, the other with a bearing free to float laterally. An additional self-aligning ring is incorporated in the bearing. Oil tight braided asbestos packing or a composition closure.

SAL Type, Standard Series



For normal shaft loads, light in proportion to shaft diameter.

SAOL Type, Heavy Series

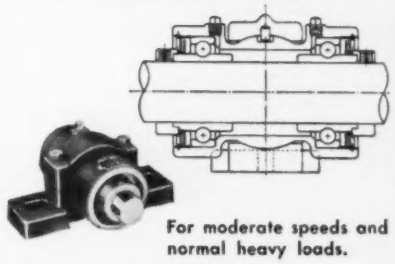


For loads heavier in proportion to shaft diameter.

★ DOUBLE PILLOW BLOCKS, with self-aligning feature

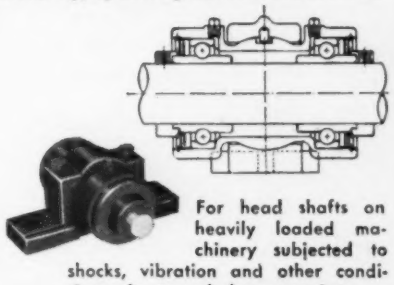
Alignment is provided in these double pillow blocks by means of a two-part base and top cap design which permits the bearing and housing to align freely on its pedestal. Compactness is gained by a low base-to-center distance. Designed for grease lubrication. As required by service, these blocks can be fitted with extra dust shields.

DSA Type, Standard Series,



For moderate speeds and normal heavy loads.

DSAO Type, Heavy Series



For head shafts on heavily loaded machinery subjected to shocks, vibration and other conditions of extremely heavy service.

Once "special", now standard

Each of these series of Fafnir Pillow Blocks was created to handle a troublesome transmission problem. Now these pillow blocks are standard, available out of stock to meet practically any condition. The same experience and ingenuity that developed this versatile line of pillow blocks backs up every Fafnir Distributor in working out a satisfactory solution to almost any power transmission problem facing you. The Fafnir Bearing Company, New Britain, Conn.

MOST COMPLETE LINE IN AMERICA

FAFNIR
BALL BEARINGS

This
FREE BOOK
shows how to save
on NAME PLATES

Over 4500 shapes and sizes of name plates for which we have dies in stock are shown in this book. By choosing one of these designs you can effect a material saving. If you or your Engineering Department can make use of it write us now for a copy of "Designs for Name plates"... Ecoa quality is enduring. Your request for a quotation is solicited—you will receive a prompt reply.

ETCHING COMPANY OF AMERICA

1520 MONTANA STREET, CHICAGO 14, ILLINOIS, DEPT. C-2

Metal Name Plates, etched or lithographed • Plastic Name Plates, Dials and Panels, lithographed or screened • Etched Metal Scales, Clock Dials, Instrument Panels, Art Novelties, Advertising Specialties • Etched Metal Panels for elevators and architectural uses.

SUBSIDIARY OF DODGE MFG. CORPORATION, MISHAWAKA, INDIANA

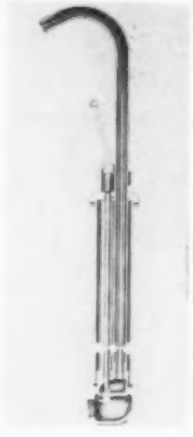
GAIR ANNOUNCES NEW PRINTING PROCESS FOR PAPERBOARD

A new printing process for paperboard, has been developed by the Robert Gair Co., Inc., 155 E. 44th St., New York, N. Y., which announces that it is printing folding cartons for the packaging field on special Gravure presses installed at the company's Piermont, N. Y. plant. The process makes for absolute fidelity of reproduction on boxboard, it is stated, with brilliance, depth and range of color values. With the Gravure printing, unlimited types of art can be used on cartons, and it is stated that the process will reproduce a lemon meringue pie on a folding carton with such fidelity that "you'll want to lick the meringue off the carton".

* * *

SELF DE-ICER HYDRANT CAN'T FREEZE UP

A new design in "frost-proof" hydrants, eliminating the need for underground pits, gravel boxes, drainage lines, sump pumps, special insulation and electric heating coils has been introduced by Crane Co., Chicago. Water actually is allowed to remain in and to freeze in the portion of the hydrant above the frost line. No water is drained off below ground. The key to this design is a rubber-lined riser-spout. Inside the riser-spout, for the entire length of the hydrant to well below



the frost line, is a rubber tube. When the valve is opened, the water flows through this tube. With the water pressure turned on, the rubber tube expands against the inside of the riser-spout, allowing a full column of water to flow. As soon as the water pressure is turned off, the rubber tubing, which is installed under tension, contracts to an internal diameter not much greater than the thickness of a lead pencil. In cold weather the thin column of water inside of the tube freezes down to the frost line. Whenever the valve is opened, water pressure again expands the tubing; and water flows up and around the "pencil" of ice. The ice breaks up and flushes out with the water, giving a free-flowing stream almost instantly.

The hydrant is completely sanitary, having no underground drainage holes whereby contamination can be picked up from polluted underground water. Stand-

(*Please turn to page* 216)

Artist – Herbert McClure, native of North Carolina

NORTH CAROLINA—*annual purchases: $2 billion—mostly packaged.*

CONTAINER CORPORATION OF AMERICA

OUTDOOR FURNITURE MAKERS Can Relax and Rest Easy

...when their costs are fastened down ... and sales speeded up ... by AMERICAN PHILLIPS SCREWS

VACATION FROM COST-WORRY: Assembly costs are controlled ... *fixed and held as much as 50% lower than you ever saw them before* ... when old-fashioned slotted screws are replaced by modern, power-driven American Phillips Screws, the *only* screws with the crossed, *cornerless* recess. Production and product-quality go up as worker-fatigue goes down. And profits flourish as rejects and spoilage all but vanish.

VACATION FROM SALES-WORRY: Customers *don't* like bungled fastenings with ugly, marred surfaces and broken screw-heads that snag clothes. And that's exactly why they *do* like American Phillips-fastened products ... because every fastening is cleanly made and attractive to look at, with never a burred head to spoil sales-appeal. So fasten *your* product with American Phillips Screws ... *and help yourself to double profits.*

AMERICAN SCREW COMPANY, PROVIDENCE 1, RHODE ISLAND

Chicago 11: 589 E. Illinois St. *Detroit 2:* 502 Stephenson Building

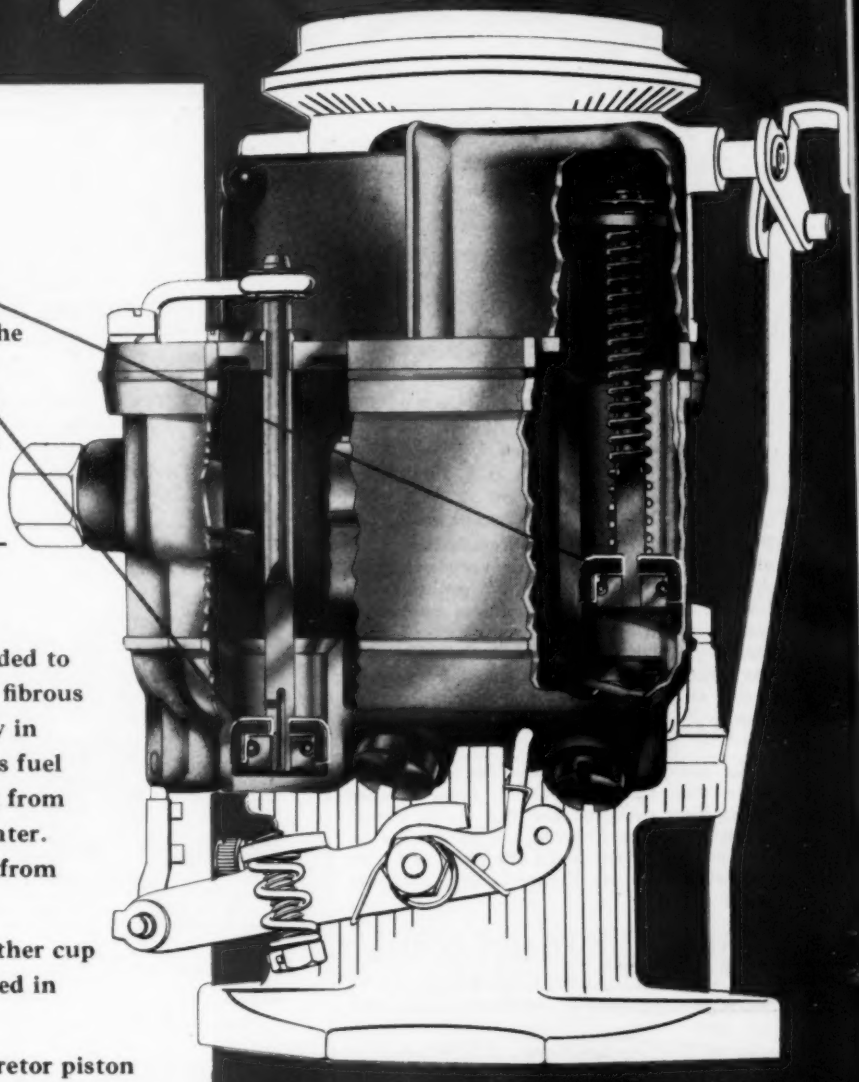
AMERICAN PHILLIPS *Screws*

ALL TYPES

ALL METALS: Steel, Brass, Bronze, Stainless Steel, Aluminum, Monel, Everdur (silicon bronze)

• IN ENGINEERING, AS IN DRIVING

it's little things that count



Like that little squirt of gasoline, when you want quick starting and fast pick-up. And the little piston pump packing which helps you get it. In Stromberg carburetors (made by Bendix Aviation Corp.), special care is taken to assure complete dependability of *every* component part. In model BXVD-3, for instance, two leather cup packings are used—one on the dash pot piston and the other on the pump piston.

These cup packings must be accurately molded to size; they must *stay* wrinkle-free; and their fibrous texture must have that tightness found only in prime calfskin. These cups must not by-pass fuel or become logged; they must neither shrink from heat nor freeze to their cylinder walls in winter. Their leather tannage must not deteriorate from contact with oils or gasoline.

Non-deteriorating *chrome* tanned Sirvis leather cup packings, made by Chicago Rawhide, are used in thousands of Stromberg carburetors.

Chicago Rawhide engineered the first carburetor piston pump packing to deliver satisfactory performance. Today, they are used in many leading makes. Because of constant research and product development, precise laboratory control, highest standards of leather quality, and exceptional care in every phase of production, Chicago Rawhide's Sirvis leather piston pump packings continue to be the most dependable.

CHICAGO RAWHIDE MANUFACTURING CO.
1203 Elston Avenue Chicago 22, Illinois

for assured performance

in your leather applications—whether in connection with oils, grease, water, or air, under high, low or static pressures—specify SIRVIS. Your inquiries will be promptly answered.

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POSTAL Department Regulations for checking postage due are very exacting. A tolerance of less than 10 grains is allowed! This means that unless your own scale has the same accuracy as Post Office scales, you are in for troubles. Either you pay excess postage (five extra 3c stamps a day is $45 a year) or you risk loss of good-will when your customers get Postage-Due Letters.

So use the same scale for your own office that the Post Office uses. Triner scales were designed for the U. S. Postal Dept. use, and 190,000 are in service in post offices today. Send the coupon below for full details on Triner Scales, available in 15 models.

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HAIRLINE ACCURACY because: 1. Twin-pendulum system with compound levers. 2. Easy-to-read pointer shows exact postage. 3. Adjustable oil control cushions all working parts; stops indicator instantly. 4. All-steel. No cast iron or agate to break.

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NAME .....

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BY .....POSITION .....

(*Continued from page 212*)

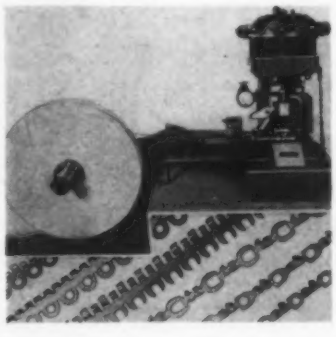
ard length is 5½ feet, which places the valve mechanism 4 feet below the surface and the outlet 30 inches above the ground. For variations in frost-line depth the hydrant can also be furnished to order for burying to depths of 3 feet and 5 feet. The open end of the spout, which is of 1-inch pipe, is threaded with standard pipe threads for attaching a hose adapter. The long-life rubber tubing inside the riser-spout is protected from the weather, sunlight and mechanical injury.

Should the hydrant be damaged or should it become necessary to replace the valve disc, the entire unit is easily disassembled without digging it up. Extreme simplicity of design permits repairs to be made quickly.

* * *

ATTACHES AND SOLDERS TERMINALS IN AUTOMATIC OPERATION

A mechanical method for soldering terminals to wires rapidly, is announced by the Patton-MacGuyer Company of Providence, R. I., which has developed self-soldered tandem terminals and attaching machine therefor. It is stated that the machine makes possible the attachment of terminals of various sizes and types at rates up to 1200 per hour with the utmost precision. The tandem terminals are furnished with just enough solder between the ears that grip the conductor to make a perfect joint without the addition of more solder. The machine utilizes the terminals in strip form which are supplied on sturdy cardboard reels. The machine cuts off, clinches, and solders the terminals at the same time in one operation. Absolute control of heat is maintained enabling the machine to heat and solder properly when supplied with any a-c or d-c voltage from 100 to 130. An automatic pressure reducing valve and air cleaner is a part of the machine, and air pressure from 50 lbs. psi and up may be used for actuating it.



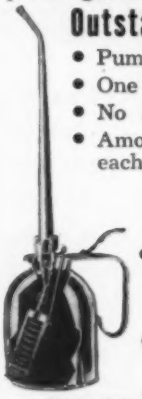
The terminal attaching and soldering machine and types of self-soldered tandem terminals used thereon.

YOU WILL FIND NEW SUPPLY-SOURCES LISTED EVERY MONTH IN PURCHASING'S CLASSIFIED SECTION! SEE PAGE 360

EAGLE means *satisfaction* and *economy* to wise buyers

Industrial buyers can save time, trouble and money by purchasing Eagle Hydraulic Pump Oilers for their plant and maintenance men.

Eagle Hydraulic Pump oilers cost no more but give complete satisfaction—easy to operate—sturdily built—long-lasting—leak-proof—guaranteed.



Outstanding Features:

- Pump any oil that flows
- One drop or a full stream
- No soldered connections
- Amount of oil ejected at each stroke accurately controlled by a controlled measure "C-M" attachment
- Detachable seamless welded spouts, interchangeable

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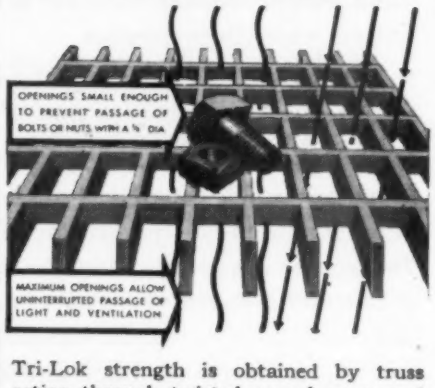
EAGLE MANUFACTURING CO.

Dept. P-249, Wellsburg, West Virginia

TRI-LOK RECTANGULAR OPEN STEEL FLOORING


OPENINGS SMALL ENOUGH TO PREVENT PASSAGE OF BOLTS OR NUTS WITH A ½ DIA
MAXIMUM OPENINGS ALLOW UNINTERRUPTED PASSAGE OF LIGHT AND VENTILATION

Tri-Lok strength is obtained by truss action through twisted cross-bar, curved in opposite directions at each bearing-bar. Standard openings in Tri-Lok Rectangular Steel Flooring are 1" x 3⅞"—other size openings can be supplied as required.

Diagonal, or Super-Safety U-type Flooring, and stair treads of all types, are available. Bulletin KH1140 describes the construction features of Tri-Lok Open Steel Flooring.

DRAVO CORPORATION

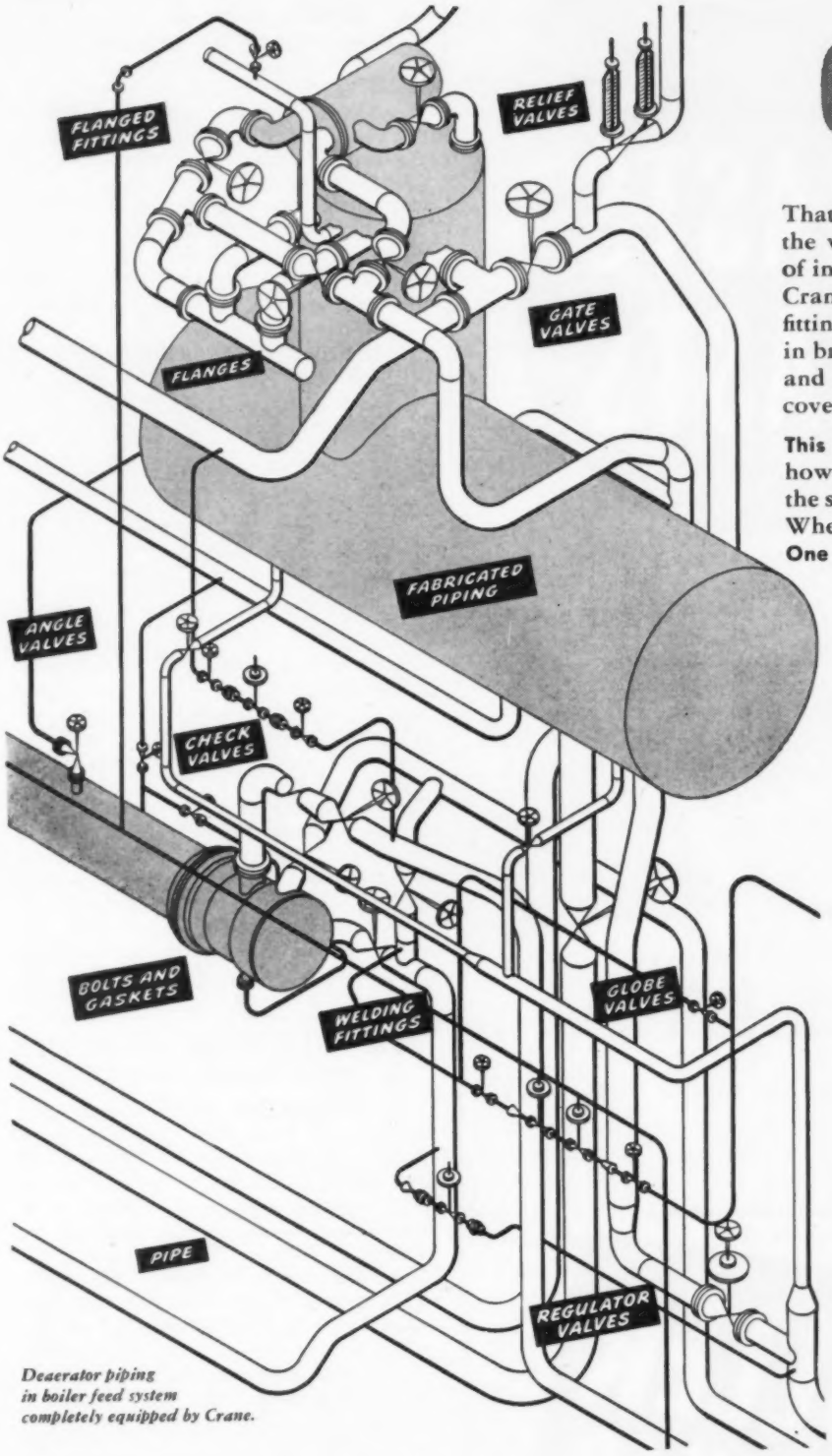
National Distributor for the Tri-Lok Company

Dravo Bldg., Pittsburgh 22, Pa.

Sales Representatives in Principal Cities

DRAVO

Everything in piping...for every need ...on one order to CRANE



Deaerator piping in boiler feed system completely equipped by Crane.

ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY

That's the kind of service you get from Crane, the world's leading manufacturer and supplier of industrial piping equipment. "Everything" at Crane includes an unequalled selection of valves, fittings, fabricated piping, pipe and accessories—in brass, iron, steel and alloys. One catalog . . . and one order to your nearest Crane Branch cover whatever is needed for the job.

This Deaerator Piping, for example, illustrates how completely Crane supplies everything for the system, regardless of the fluids to be handled. When you standardize on Crane, you depend on **One Source of Supply** broad enough to simplify every piping procedure. You get better installations . . . avoid needless delays . . . by placing **Undivided Responsibility** on Crane for materials. And for **Highest Quality** in every piping item, specify Crane Quality—unsurpassed for more than 90 years.

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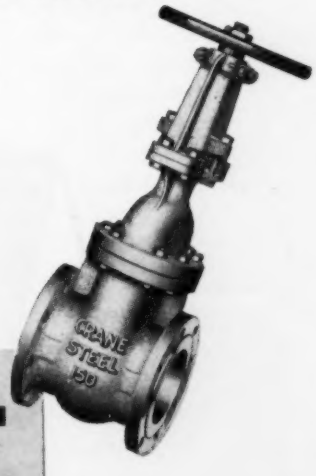
Branches and Wholesalers Serving All Industrial Areas

FOR TOUGH STEAM SERVICES *up to 750 deg. F., and for water, oil, air, gas and other non-lubricating liquids up to 500 deg. F., Crane recommends No. 47XR 150-pound Cast Steel Wedge Gate Valves. Designed for tight seating with long-lasting Exelloy to Nickel Alloy. Screwed, flanged or welding ends. Sizes: 2 in. and larger. See your Crane Catalog, p. 304.*



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FOR EVERY PIPING SYSTEM

Want Additional Product Information? See Page 19.

Not affected by oil, gasoline or cleaning compounds. The full, firm sweeping surface of this brush wears down evenly. Staple-set in solid, polished hardwood blocks. In sizes from 12" to 42".

Phone your local Fuller Branch Office or write

The FULLER BRUSH CO.

INDUSTRIAL DIVISION
3554 MAIN ST., HARTFORD 2, CONN.

IN CANADA: FULLER BRUSH COMPANY, LTD., HAMILTON, ONTARIO

NEW ROLLER CHAIN DEVELOPMENT

A step ahead in safety, as well as considerable reduction in shutdowns caused by roller chain shear, are claimed for a new development announced at Atlas Chain & Manufacturing Company, Philadelphia, Pa. These improvements for roller chain users —in the mines, on the oil fields, on construction equipment, plant machinery, etc.— are the result of a new method of fastening roller chain.

Atlas' new fastener is a unique type of retaining ring having no dangerous points exposed. Provided with three, internal, equally spaced teeth, it is sprung radially into a groove on the pin. The mathematically-predetermined, equal spacing of these teeth, and spring action of the connecting links, assure that the ring will maintain a tight groove tension at all times.

Consequently, when struck by a direct blow, it merely turns in its groove, hugging it tightly. Even if the blow should come from the unlikely angle or shape that would tend to shear, the retaining ring has a greater shear area than most conventional fasteners.

If disassembly should be necessary, the recesses between the teeth make the ring sufficiently resilient to permit the necessary spread without giving the ring a permanent set. As can be seen in the attached photograph, disassembly is easy, fast, and can be accomplished with an ordinary screw driver.

NEW TEXTILE FINISH ANNOUNCED BY AMERICAN POLYMER CORP.

A textile finish which requires no curing, yet which will last through a number of launderings or dry cleanings and which is claimed to be well on its way to revolutionizing the treatment of cotton and rayon, is manufactured by American Polymer Corporation of Peabody, Mass., under the name Polyco 337. This new stiffener, it is said bids fair to replace starch in the finishing of textiles.

Currently sold only to manufacturers of textile finishes, Polyco 337 comes as a water-thin material containing 35% resin solids. It requires no high temperature curing because the evaporation of the water content fully sets the polymerized resin. No solvents are used in its manufacture. It absorbs no chlorine on bleaching. Its non-inflammable and non-toxic qualities recommend it for use under about any conditions.

The new finish is compatible with starches, dextrines, gums and other con-

(*Please turn to page 222*)

IT'S NEW
IT'S VALUABLE
IT'S **FREE!**

...The Most Complete Full Color Guidebook on Decal Nameplates Ever Published

Manufacturers! Executives! Meyercord, world's largest producer of decalcomania, offers this brand-new "Mark-It" Manual on Decal Nameplates *free.* Twenty full-color pages. New Decal developments. New application techniques. Information vital to every business. This handy reference book shows how America's leading products are Decal-marked by Meyercord—to save time labor, material . . . to provide colorful brand recognition . . . permanent product identification with nameplates that *sell!*

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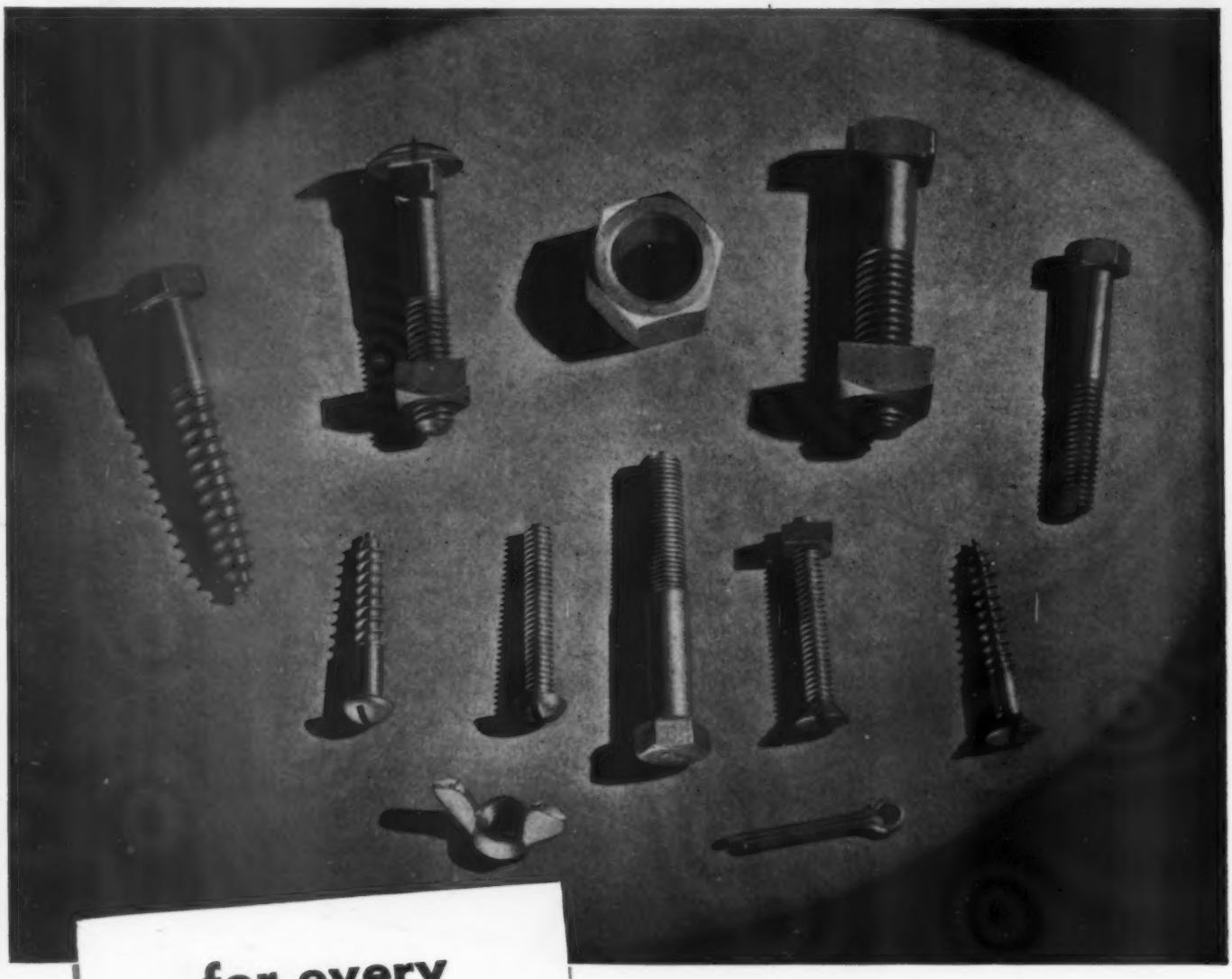

for every Requirement in FASTENERS...

Other *"National"* Products Include
HODELL CHAINS
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You can, we believe, simplify your procurement of fasteners by coming to "National". Besides the most complete line of standard fasteners made by any manufacturer, we make many special products, such as Phillips Recessed and Clutch Head screws and bolts, Rosán and Lok-Thred fasteners, Sems, Twin-Fast double thread wood screws, and lock nuts for every purpose.

In many cases we have helped design new fasteners to meet special needs. Our unusual experience and facilities in cold heading have solved numerous production and cost problems for our customers.

"National" products have earned a reputation for quality which they will continue to deserve.

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Pacific Coast: National Screw & Mfg. Co. of Cal.
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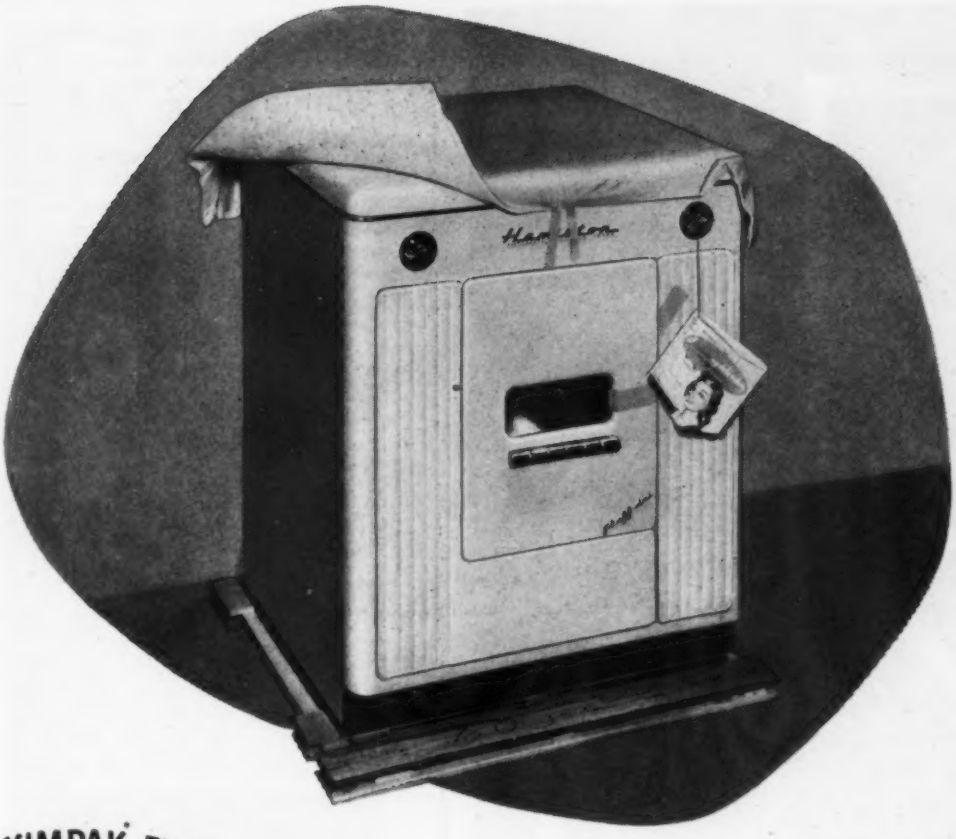
National
HEADED AND THREADED
PRODUCTS



KIMPAK* FLOAT PACKAGING

Cuts shipping costs – reduces damage in transit!

Now—give your product *better* protection—save money—and deliver a more presentable package. KIMPAK is so easy to apply, it saves dozens of man-hours in the packaging operation. Soft, resilient, flexible—KIMPAK adds little to the shipping weight. And so efficient, that complaints and rejects due to damage enroute are rare.

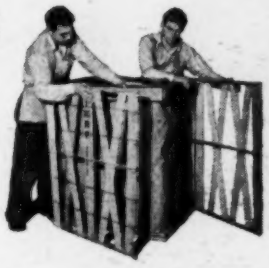
KIMPAK is versatile. Buy it in rolls, sheets or pads to suit your convenience. There's a specification to meet every requirement of the Four Basic Methods of Interior Packaging . . . Surface Protection, Flotation Packaging, Blocking and Bracing, Absorbent Packaging. At your first opportunity, test KIMPAK "Float Packaging"—and *save!*

PLEASE ACCEPT THIS FREE BOOKLET

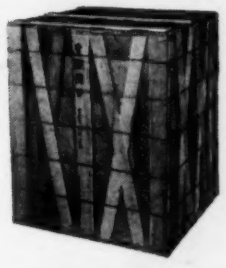
"Float Packaging" will help you improve your packaging methods . . . and it's available to you at no cost. For your copy, simply call or write your local distributor, listed in the classified phone book under *Packaging Materials, Shipping, Wadding, Packing Equipment and Supplies,* or *Shipping Room Supplies.* Or use the coupon below.

Thick cushioning blanket of KIMPAK is laid over top of cabinet and down sides.

Kraft bag is pulled over the KIMPAK cushioning and down to the base.



Corrugated head cap and the sides of wire-bound crate are placed in position.



Completed shipping package affords protection from damage to surface of cabinet.

All photographs courtesy of Hamilton Manufacturing Co., Two Rivers, Wis.

Looks Better . . . Protects Better

Kimpak

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A PRODUCT OF Kimberly Clark RESEARCH

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Neenah, Wisconsin

Please send me free, the illustrated KIMPAK packaging guide.

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P-249

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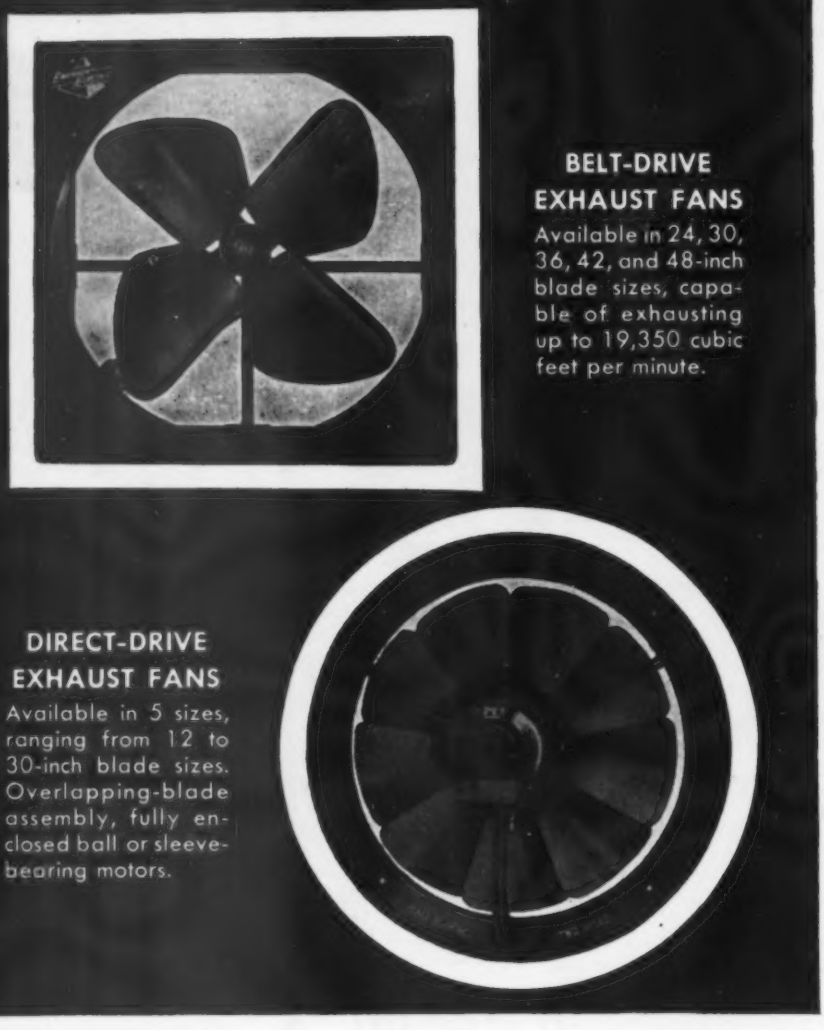
Want Additional Product Information? See Page 19.


BELT-DRIVE
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Available in 24, 30, 36, 42, and 48-inch blade sizes, capable of exhausting up to 19,350 cubic feet per minute.
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Available in 5 sizes, ranging from 12 to 30-inch blade sizes. Overlapping-blade assembly, fully enclosed ball or sleeve-bearing motors.

Give your losses an AIRING!

- FATIGUE LOSS
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Human beings never become "acclimated" to bad air conditions, although you may never hear a word of complaint. But, the *effects* are inescapable. Winter or summer, *air in motion* keeps people in action . . . reduces fatigue, steps up efficiency. It pays to ventilate with fans made by Emerson-Electric . . . pioneers and leaders in supplying dependable air-moving equipment for 58 years. See your electrical contractor, or write for free Exhaust and Ventilating Bulletin No. T-119.

THE EMERSON ELECTRIC MFG. CO. • ST. LOUIS 21, MO.

EMERSON ELECTRIC
MOTORS • FANS — APPLIANCES

(*Continued from page* 218)

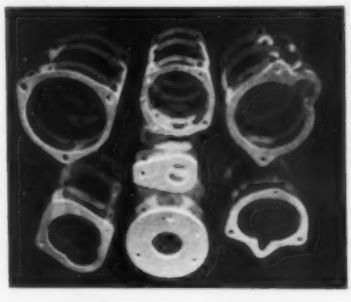
ventional textile sizing agents and its application requires no special operations or special machines.

Besides laundry-resistant stiffening, Polyco 337 provides also extra resistance to soiling, abrasion and wear, increased fabric strength and no discoloration on exposure to light or embrittlement on ageing. Users, it is claimed, will experience no difficulties in calendering and can drying operations and the ultimate consumer is assured of additional ease and smoothness in ironing fabrics so treated.

Technical Data Sheet P-12 with complete details on Polyco 337 is available on request.

PUNCHED SILICONE RUBBER PRODUCTS

A line of punched silicone rubber products, including gaskets, washers, seals and packings, are announced by the Stalwart Rubber Co., 162 Northfield Road, Bedford, Ohio. The products are recommended for use in processing systems handling hot or cold fluids or gases and wherever rubber comes into



Temperature range for these silicone products is —150 to 500 deg. F.

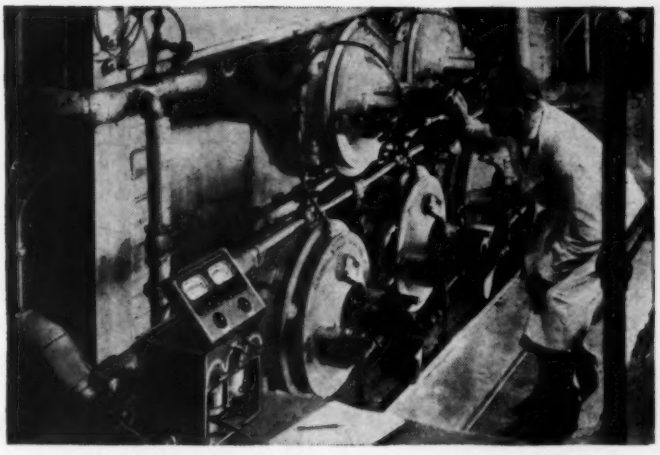
contact with extreme hot or cold conditions. The manufacturer states that standard and unusual flat shapes punched from cured sheets of silicone rubber can be made to exacting specifications, and the location of bolt holes held to practical accuracy. One of the features of silicone rubber is its ability to withstand extreme temperature changes ranging from —150 to 500 deg. F. Other qualities include resistance to permanent compression, prolonged weathering, lubricating oils, some chemicals, and water. It is suitable for dielectric applications.

BOOKLET ON CENTRI-DIE CASTING

The Centri-Die process of centrifugal casting in permanent molds is given comprehensive treatment in a new bulletin, Centri-Die Castings, published by Lebanon Steel Foundry, Lebanon, Pa. The process has been described as one of the most important recent advances in the casting of carbon, special alloy and stainless alloy steels for severe heat-resistant and corrosion-resistant service. The 12-page illustrated booklet gives particular emphasis to the possibilities

(*Please turn to page* 224)

"How do we know we're getting maximum efficiency from our heating units?"



"CONTROL OF HEATING UNITS in various processing steps in our paper manufacturing plant was vitally important to our production. Until we called in a Cities Service Engineer we actually had no scientific check on what percentage of fuel was converted into productive energy . . . how much was wasted . . . or whether we were getting the maximum amount of heat from our fuel."

"THE INDUSTRIAL HEAT PROVER—the remarkable Cities Service developed instrument told us quickly and accurately the answers to these questions."

The Heat Prover can be used on industrial furnaces of every design regardless of the type of fuel used. It is also useful in analyzing faulty diesel engine performance. Write for a free demonstration today.

Free—A fact-filled booklet entitled "Combustion Control for Industry." Write Cities Service Oil Company, Sixty Wall Tower, Room 313, New York 5, New York.

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We are sure you will find it both PLEASANT AND PROFITABLE to consult a NATIONAL SANITARY SUPPLY ASSOCIATION MEMBER about any of your cleaning, maintenance and sanitation problems.

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WRITE FOR MONTHLY TUBE STOCK BULLETIN

(*Continued from page 222*)

for Centri-Die production of circular shapes required in the oil, textile, chemical, paper and pulp, mining and aviation industries, and others in which there is constant need for cylindrically cast parts of low structural alloy heat-resistant or corrosion-resistant metals, as well as components for sub-zero applications.

Text and pictorial data also put emphasis on uniformity of metal structure metal conservation, production economies, finishing procedure and inspection methods under the process. Data sheets list general type compositions adaptable to Centri-Die production, incorporating castings which can be furnished to meet nationally accepted specification requirements, and special alloys.

Listed as advantages inherent in the process are: (1) higher quality castings of greater density, (2) readily achieved production of assorted and complex structural shapes which cannot be satisfactorily cast by static methods, (3) uniformity of casting strength, throughout, and (4) use of alloys which are difficult or impossible to forge, opening the door to applications hitherto considered impractical or too costly.

USE OF WIREBOUND CRATES AUTHORIZED FOR FURNITURE SHIPMENTS

The use of wirebound crates has been authorized by the railroads for shipping all items of furniture, both metal and wood, heretofore permitted in wooden crates. The new authorization for wirebound crates is in Amendment No. 4 to Consolidated Freight Classification No. 18, now in effect.

Headquarters of the Wirebound Box Manufacturers Association, which led the fight for acceptance by the railroads of wirebound crates for furniture, hailed the ruling as making available to the furniture industry scientifically engineered and sturdily constructed shock absorbing crates that for many years have been widely used as standard shipping containers by many industries.

"Furniture manufacturers who have used wirebound crates under permit have proved that they are ideal shipping containers for many kinds of items listed as furniture by the railroads," said L. S. Beale, secretary of the W.B.M.A. "Wirebound shipping containers for furniture had never been banned or prohibited by the railroads, but, until recently, no attempt was made to have them classified as permissible."

Formal petition for acceptance of wirebound crates as suitable containers for carrying furniture items was filed over a year ago. In a series of rugged laboratory tests in Chicago last January before representatives of territorial Consolidated Freight Commitees, wirebound crates packed with furniture items—a drop-leaf table, glass-front secretary, heavy buffet, and open-front bookcase—proved their sturdiness, structural strength, shock absorbence, and general

(*Please turn to page 228*)

More OEM's* Specify US Gauge Than Any Other Make!

* Original Equipment Manufacturers

. . . Because USG Assures More Value

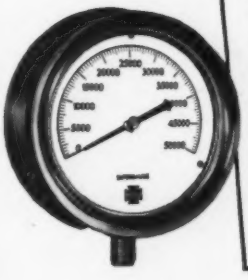
Throughout industry, the story is the same from year to year. Original equipment manufacturers (OEM's) demand substantial gauge value . . . accuracy, durability, and quality at economy prices . . . and 6 out of 10 specify US Gauges.

They know that US Instruments give more service, more accuracy, more *value* for the money. They know USG can supply all their needs—from highly specialized instruments measuring as low as 1" of mercury absolute, to standard type gauges measuring from 30" vacuum to 100,000 pounds pressure per square inch. And they know that for more than 40 years US Gauges have been the standard of dependability. So more original equipment manufacturers specify US Gauges than any other make.

Next time you order gauges, follow the lead of these satisfied users . . . buy US Gauges. For more information about US Gauge write today. United States Gauge, Division of American Machine and Metals, Inc., Sellersville, Penna.

SUPERGAUGE FIG. 1600

For heavy-duty service where a gauge of quality and high accuracy is required. Stainless steel movement with deep bushed bearings. Phosphor bronze, beryllium copper or welded stainless steel bourdon tube in iron or phenolic cases. Lower or back connections. Ranges: 0 to 30" vacuum, 15 to 20,000 lbs. p.s.i.



HIGH PRESSURE SOLID FRONT GAUGES

Designed for testing high pressure gases and liquids these gauges are built to the highest possible standard. Solid wall, cast integral with case, separates the tube and movement section from observer. Bourdon tubes of specially selected beryllium copper or stainless steel are threaded at both ends. Has deep bushed stainless steel movement of high ratio. Cast brass case and ring. Ranges: 100 to 100,000 lbs. pressure.

ABSOLUTE PRESSURE GAUGE

A highly accurate, dependable instrument for measuring absolute pressures. Gauge is seal case type designed to indicate pressure or vacuum admitted to interior actuating the seasoned beryllium copper diaphragm. Black molded phenolic case is corrosion resistant, suitable for use in highly contaminated atmospheres. Dial is 2¾" in diameter. Ranges: 20 millimeters to 100 inches of mercury.

US GAUGES—BETTER INSIDE . . . BETTER OUTSIDE . . . BETTER ON YOUR PRODUCT

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UNITED STATES GAUGE

PRODUCTS OF UNITED STATES GAUGE... Absolute Pressure Gauges • Aircraft Instruments • Air Volume Controls • Altitude Gauges • Boiler Gauges • Chemical Gauges • Dial Thermometers • Glass Tube Thermometers • Flow Meters • Inspectors' Test Gauges • Laboratory Standard Test Gauges • Marine, Ship and Air-Brake Gauges • Recorders • Controls and Alarm Gauges • Voltmeters • Ammeters • Welding Gauges

Want Additional Product Information? See Page 19.

Announcing

NEMA Sizes 0, 1, 2, 3
for a-c motors
up to 50 hp

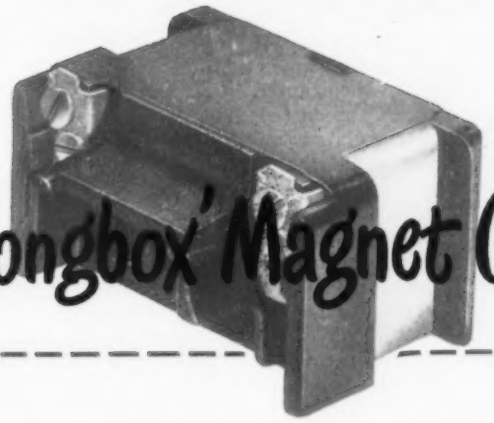
GENERAL ELECTRIC

a complete NEW line

MOTOR STARTERS

with the

'Strongbox' Magnet Coil



all new all the way thru

Here it is—a completely new line of G-E motor starters—full-voltage starters made for extra-long life, faster installation. Designed for easy maintenance, but built so you can forget them.

NEMA Sizes 0, 1, 2, and 3—each size new all the way through. Everything's new—contacts, arc hood, magnet, armature, and the tough Strongbox magnet coil. Get your first G-E starter and compare!

SO NEW
SO DIFFERENT
YOU CAN'T AFFORD TO WAIT
ORDER TODAY!

General Electric Company
Apparatus Dept.
Sec. U676-277
Schenectady 5, N. Y.

Please send me your bulletins describing the new a-c motor starters:

GEA-5153 (CR7006 A-c Magnetic Starter)_____

GEA-5156 (CR7008 A-c Combination Starter)_____

Name_____

Company_____

Address_____

SAVE

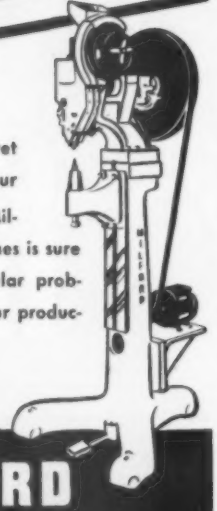
• MATERIALS
• MAN-HOURS
• MONEY

with the . . .

RIGHT RIVETS

Select exactly the right semi-tubular, split rivet, or cold-headed fastener from Milford's complete line. You'll find it pays in every way!

RIGHT MACHINE



Then use the right rivet setting machine for your application. One of Milford's 15 basic machines is sure to solve your particular problem . . . and slash your production costs!

Write to Dept. B

MILFORD
RIVET & MACHINE
COMPANY
MILFORD, CONN.
ELYRIA, OHIO
HATBORO, PENN.

(*Continued from page* 224)

all around protective qualities.

Even when subjected to the punishing conbur incline test, the glass front of the crated secretary was undamaged. The small crate carrying the open-front bookcase withstood more than 3,000 pounds of verticle pressure with only minor damage to itself while fully protecting its contents. Repeated drop tests on the corners, edges and faces of containers failed to reveal structural weaknesses, but convinced the witnesses that the wirebound crates were well able to withstand more than the ordinary shocks and jars experienced during routine shipment and handling.

Since shortly after the January, 1948, tests, permit to use wirebound crates for furniture items without freight charge penalties has been issued upon request by the territorial Consolidated Freight Committees. With publication of Amendment No. 4 to Consolidated Freight Classification No. 18, however, such permits need no longer be sought so long as the wirebound crates used meet the specifications set forth in the amendment.

DECAL FOR SPECIAL SURFACES

A decalcomania especially designed for application on plastic surfaces, sheetings, baked synthetic enamels, wrinkle finishes, leatherette, leather, and synthetic fabrics, is being marketed by the Christman Engraving Co., Battle Creek, Michigan. A special feature of the new product is described as being its cumulative adhesion. The manufacturer states that it sets up an ample bond within a few hours after application, improving from week to week until finally it is welded, for all practical purposes, to the surface. It is applied by the water method, without the use of special solvents or cements, and the maker states that it will never dry out and chip off. It is also said to be suited for wrinkle finishes, etched and polished aluminum, chrome and nickel plate, stainless steel and the bake synthetic enamels. Samples and further information available without cost.

TITANIUM PORCELAIN ENAMELS

Improved resistance to staining, shock, abrasion and scratching are said to feature titanium porcelain enamels, one of the porcelain enameling industry's newest developments. Besides stain resistance, shock resistance, abrasion resistance and scratch hardness, the new enamels are said to provide a higher degree of reflectance and to make possible the application of much thinner porcelain enamel coatings. Thinner coatings are said to contribute considerably to the durability of the finished product. The increased opacity they provide eliminates the need for the conventional blue ground or first coat of enamel, and they achieve their whiteness in a single application.

(*Please turn to page* 230)

Eliminate the Shadow Menace
INCREASE MACHINE ACCURACY
WITH
VIMCO Light

KEEP COSTS DOWN!

Get hi-intensity lighting where you need it most. Socket with ball swivel joint. Oil-proofed flexible arm available for wet machine work. Variety of base fittings . . . easy to install. Many standard styles. Special engineered machine lighting upon request.

VimcoLight above on Heston & Anderson Band Saw.

Write for Folder No. 74
Distributorships Available

VIMCO MFG. COMPANY, Inc.
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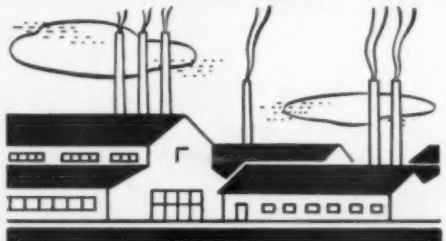

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DIXISTEEL forgings and stampings are made of carefully analyzed steel produced in our own open hearth furnaces. They are of highest quality and strength.

Send us your prints or specifications for forged or stamped parts, and we will be pleased to submit our estimate for production.

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P. O. BOX 1714 DIXISTEEL ATLANTA 1, GEORGIA

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Write for your personal copy of Catalog A-50...60 pages of exceptional tool values...yours for the asking.

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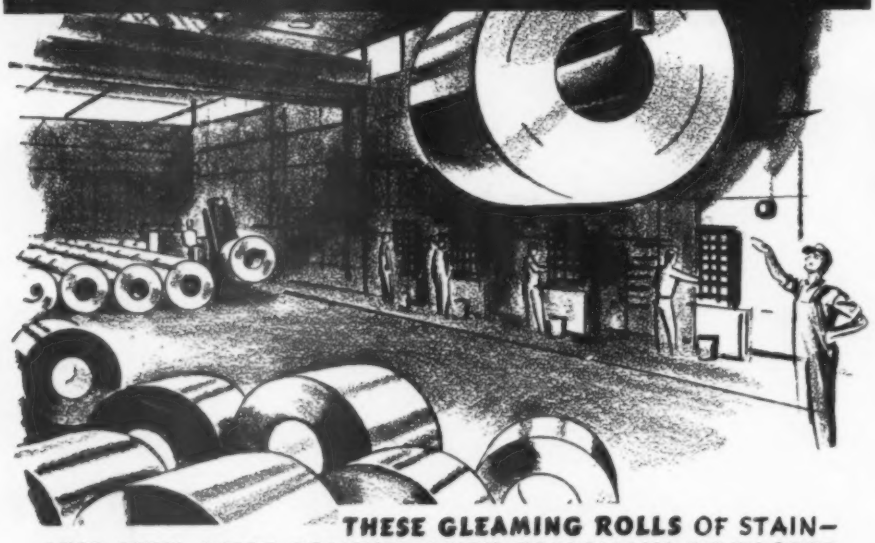
OPEN END, BOX, ADJUSTABLE AND RATCHET WRENCHES; DETACHABLE SOCKETS AND SETS; IMPACT SOCKETS; TOOL HOLDERS; LATHE DOGS; "C" CLAMPS; CHAIN PIPE TONGS AND VISES; FLANGE JACKS; PLIERS; SCREWDRIVERS; PUNCHES AND CHISELS; SOFT FACED "NUPLAFLEX" TIPPED HAMMERS; HOIST HOOKS; EYE BOLTS; ROD ENDS; CRANK AND BALANCE HANDLES; THUMB SCREWS AND NUTS.

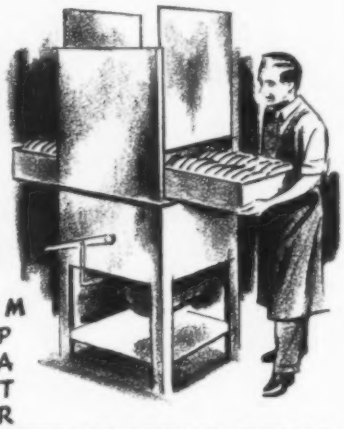
J. H. WILLIAMS & CO., BUFFALO 7, N. Y. *Distributors Everywhere*

A Shining Example of JEWEL POLISHING!



THESE GLEAMING ROLLS OF STAINLESS STEEL WERE POLISHED WITH ESPECIALLY DEVELOPED JEWEL SILICON CARBIDE PAPER BELTS . . . BELTS THAT CUT FASTER, LAST LONGER, BECAUSE THE ABRASIVE IS CEMENTED TO A STRONG PAPER BACKING WITH BONDITE . . . A POWERFUL, HEAT RESISTING ADHESIVE. AND THESE BELTS HAVE THE EXCLUSIVE, SMOOTH-RUNNING VELVET JOINT THAT WILL NOT JUMP OR SCRATCH THE FINISH. SO IF YOUR PRODUCTION IS BOGGED DOWN IN THE POLISHING STAGE, TRY JEWEL ABRASIVE BELTS FOR STAINLESS STEEL.

IN PRODUCT ASSEMBLY JEWEL ABRASIVES ARE USED TO FINISH THESE EFFICIENT AUTOMATIC DISHWASHERS. AFTER WELDING, THE CORNERS AND EDGES OF THE STAINLESS STEEL CABINETS ARE POLISHED WITH NO. 80 JEWELOX CLOTH X73. THE MANUFACTURER REPORTS, "THIS CLOTH IS THE BEST WE'VE EVER USED."



AND HERE'S A 3-WAY PROBLEM LICKED BY AP ENGINEERS. A PROMINENT MANUFACTURER OF CUTLERY WANTED AN ABRASIVE THAT COULD BE USED TO FINISH CARVING KNIVES WITH STAINLESS STEEL BLADES, COCOBOLO WOOD HANDLES, AND BRASS RIVETS. JEWEL SILVER STREAK CLOTH BELTS, GRIT NO. 80, OUTPERFORMED ALL OTHER ABRASIVES IN CUTTING THIS UNUSUAL COMBINATION OF MATERIALS.

SO REMEMBER JEWEL WHEN YOU ORDER COATED ABRASIVES. THERE'S A JEWEL PRODUCT FOR EVERY POLISHING AND GRINDING NEED. AND PROPERLY USED JEWEL ABRASIVES WILL SPEED YOUR WORK, CUT YOUR COSTS!

Abrasive Products, Inc.

SOUTH BRAINTREE 85, MASSACHUSETTS · MAKERS OF JEWEL COATED ABRASIVES

AIR AND HYDRAULIC PRESSURE AND FLOW CHARTS

New air and hydraulic pressure and flow charts that provide data that would otherwise require laborious calculations, are available from the Miller Motor Co., 4027 N. Kedzie Ave., Chicago, Ill. Tables show push and pull stroke pressures, oil consumption of hydraulic cylinders and air consumption of air cylinders, pipe sizes for hydraulic circuits, friction pressure loss, losses in fittings and valves, and recommended piston rod diameters for various loadings and mounting condition. The chart is available in two sizes: three-color 22" x 34" wall chart, an 8½" x 11" size in black and white perforated for ring binder filing.

HIGH SPEED FRICTION SAW MELTS AS IT CUTS

The accompanying illustration shows steel saw, which melts steel as it cuts it at the rate of 13 feet a minute. The saw, built to exacting specifications of the United States Steel Company engineers, is operated by remote electrical control and was designed to make square, burrless cuts across heavy steel sections,

The saw melts as it cuts

such as structural shapes. Its teeth whir faster than 320 miles an hour at its normal speed of 1,750 revolutions a minute. When the blade makes contact with hard, tough steel, friction generates heat more rapidly than the material can absorb it. The intense heat melts the surface and the teeth carry it away. The operator is protected by a transparent plastic shield. This is the first of several highspeed friction saws to be installed at warehouse of the United States Steel Corporation.

VISUAL MERCHANDISING PACKAGE

The Comet Envelope Can and Paper Co., New York, N. Y., has introduced a combination paper and visual merchandising Pliofilm bag in a wide variety of sizes, for the display of merchandise that is likely to become soiled in handling by clerks and prospective customers. The Pliofilm, a tough, crystal-clear film, is laminated to a paper sheet which serves as the backing for the displayed material. The pliofilm face is extremely tear-resistant.

(*Please turn to page* 232)

time

is proving the

1953 1952 1951 1950 1949

economy

of LADISH

Controlled Quality SEAMLESS WELDING FITTINGS

Extra service and dependability . . . that's the dollars-and-cents saving you obtain from Ladish Controlled Quality Fittings. It's built into them — through unsurpassed metallurgical and manufacturing controls — extra service that saves you dollars.

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A COMPLETE LINE PRODUCED UNDER ONE ROOF
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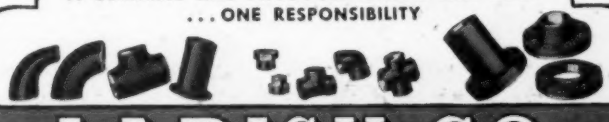

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DISTRICT OFFICES: New York • Buffalo • Pittsburgh • Philadelphia
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Systematized Sanitation

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- Labor-saving methods
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Write today for booklet about this simple, individualized plan which enables your present personnel to do more tasks—better!

The GERSON-STEWART Corp.

LISBON ROAD · CLEVELAND, OHIO

ELECTRIC WHEELS

Designed to do the Job

Wheels and Axles are our business, and our engineers are well qualified to recommend the most efficient assembly for your product.

Our factory is modern and tooled for low cost production. We have supplied manufacturers in many different industries for more than 50 years.

Standard or Special, ELECTRIC Spoke-type or Disc Wheels are built for most types of portable equipment.

Send us your specifications and we will submit our recommendations.

ELECTRIC WHEEL CO., 2913 Pine, Quincy, Ill.

SCRAP NEEDED TO ASSURE SUFFICIENT STEEL

America needs heavy industrial scrap —a million tons of it, and the Federal Department of Commerce is taking active part in a nation-wide campaign to salvage heavy scrap in the form of obsolete machinery and equipment, which will enable mills and foundries to produce more steel with the same equipment. Heavy scrap is wanted because it makes better steel faster; the furnaces need to be charged only once.

The goal is an accumulation of sufficient heavy scrap to assure adequate stocks to meet both domestic and military needs, and ERP.

The Department states that it would be almost impossible to over-estimate the importance of iron and steel scrap which together with pig iron form the principal raw materials for the manufacture of steel. Secretary of Commerce Charles Sawyer recently declared that "scrap metal—to be more exact, scrap iron and steel,—is today our chief strategic raw material. It is strategic for our domestic economy, for our overseas aid and recovery program and for our defense and re-armament effort."

The particular need at present is not what might be termed alley scrap. What is needed is heavy industrial scrap in the form of obsolete and discarded steel plant-equipment of one kind or another, and the tons of erstwhile scrap material that is accumulating in yards and warehouses of industrial and manufacturing plants.

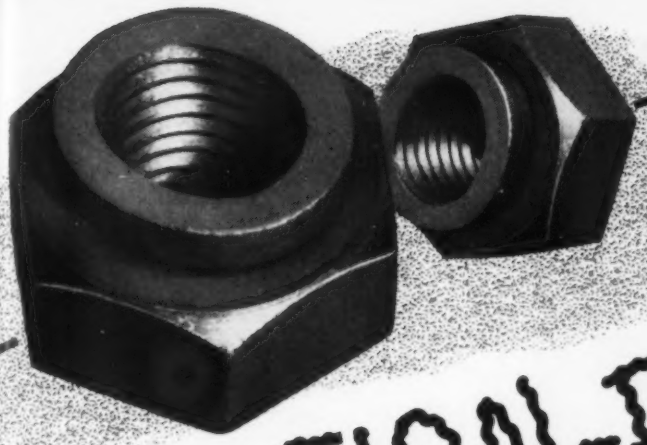
This is the material that is indispensable in the building of what might be termed a "national security" surplus. The plain fact of the matter is that there simply is not enough steel to go around. In spite of the stupendous peacetime production of approximately 90 million net tons annually there is not nearly enough steel to meet the demands of our domestic economy and other needs.

The present scrap drive is being confined to industry, auto wrecking yards, and the nation's farms, for it is the heavy grade of scrap that makes the best steel. In spite of the fact that vast amounts of steel scrap have been collected and delivered to the iron and steel industry, many mills and foundries have been shut down for the lack of scrap. And the important fact is that the improvement and protection of our national economy is dependent upon the protection that is available only through adequate inventories of scrap.

By the end of 1948 our ingot capacity was increased by over a million tons, and it is expected that it will be increased another million tons by the end of 1949.

At the present rate of consumption the demands of our domestic economy, military requirements and ERP are not being met. Very little of the millions of tons of steel exported during the war have come back as scrap. The receipt of scrap from Europe to date as compared to requirements is but a mere trickle, and the quantity will not be greatly increased until transportation fa-

(*Please turn to page* 234)



VIBRATION-PROOF!

¼" TO 2" DIAMETERS
PACKAGES OR BULK

PATENT No.
2,255,286

LAMSON LOCK NUTS

Does a product of yours have the "shakes"? Is it subjected to conditions where vibration is a major problem? If so, it will pay you to consider the use of inexpensive Lamson Lock Nuts.

These one-piece all-steel lock nuts have a heat-treated spring-grip locking collar which HOLDS the nut on the bolt under the most severe conditions of vibration. They will hold until backed off with a wrench and can be reused without loss of grip. Tests at 600°F. and -40°F. prove that neither heat nor cold materially affect their holding power. They are also unaffected by steam, oil or water.

Manufacturers of machinery, earth moving equipment, pumps, trucks and other products subjected to severe vibration have found Lamson Lock Nuts the ideal solution to their fastening problems. Write *today* for additional information.

THE LAMSON & SESSIONS COMPANY

General Offices: 1971 West 85th Street, Cleveland 2, Ohio

Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

Lamson & Sessions

"One Dependable Source for All Fastener Needs"

SEMS	LOCK NUTS	NUTS	STUDS
STOVE BOLTS	LAG BOLTS	WASHERS	RIVETS
TAPPING SCREWS	ROPE CLIPS	SET SCREWS	PLOW BOLTS
"1035" CAP SCREWS	MACHINE BOLTS	CARRIAGE BOLTS	COTTER PINS

WANT MORE INFORMATION on any of these fasteners? **CHECK**—and **CLIP** this strip.

—CUT ALONG THIS LINE—

LAMSON LOCK NUTS: Economical, vibration-proof. Can be re-used repeatedly.

"1035" SET SCREWS: Cup point type, hardened, heat-treated.

COTTER PINS: Steel, Brass, Aluminum and Stainless Steel.

SPECIAL NUTS: Cone, Barrel, Oblong, Plier, Tri-Slot, Half-round, etc.

PHILLIPS AND CLUTCH HEAD: Machine Screws and Tapping Screws.

MILLED STUDS: Concentric, accurate, in a full range of sizes.

"BENT" BOLTS: Including U Bolts, Eye Bolts, Hock Bolts, etc.

WEATHER-TIGHT BOLTS: Eliminate counter-boring in wood assemblies.

PIPE PLUGS: Forged Steel, heat-treated.

The Lamson & Sessions Company
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POSITION

COMPANY

STREET

No LOST PARTICLES in

NEWARK A.S.T.M. Testing Sieves

NEWARK for ACCURACY

- **NO CREVICES** between cloth and frame to catch and thus "lose" particles.
- **EXACT OPENINGS.** Newark Standard Testing Sieves are made to conform to the latest specifications of the National Bureau of Standards.
- **CLOTH STRONG and DURABLE.** We weave the metal cloth in our own plant, thereby controlling its quality.
- **RE-COVERING SERVICE.** When the wire cloth is worn out return the sieves for re-covering. Often there is a saving.

Our new four page folder gives complete details and specifications. May we send you a copy?

Newark Wire Cloth COMPANY

346 VERONA AVENUE • NEWARK 4, N. J.

(*Continued from page 232*)

cilities within European countries materially improves.

The need is critical, and the urgent appeal for scrap is directed not only to the metal working industries, but to all divisions of American industry. Manufacturers in the woodworking, bakery, shipyard, food products, textile, office equipment, petroleum, paint, packaging, institutional, governmental and other fields are a reservoir of hundreds of thousands of tons of badly needed scrap.

Scrap is defined as being any piece of steel that is not being used. It includes the waste products of fabrication and machining. It includes obsolete, worn out and broken equipment, old dies, jigs, fixtures, gears, wheel, chains, valves, and so on. It also includes work rejects and old and odd repair parts gathering dust.

The price of steel is at an all time high. Part of the price of steel is the price of scrap and part of the high price of steel is due to the lack of and difficulty in procuring scrap.

The drive obviously is of immediate importance to the industrial purchasing agent for ordinarily he is responsible for the disposal of factory scrap and salvaged materials and equipment.

It is suggested that purchasing agents in all divisions of industry inaugurate a scrap drive in their respective plants, and work with management in the appointment of a salvage committee or some official to survey their plants, and turn over to their local scrap dealers as soon as possible all of the old iron and steel that can be disposed of.

PLATINUM METALS USES EXPAND IN INDUSTRIAL APPLICATIONS

"Two-thirds of all the platinum metals sold to United States consuming industries in 1948 were for electrical, chemical, dental and miscellaneous purposes of an industrial nature, indicating that these precious metals served the public extensively as hard-working metals as well as for adornments," according to Dr. Charles Engelhard, President of Baker & Company, Inc., New York, dealer and refiner of platinum metals.

"Sales of all six platinum metals to United States consuming industries during the first nine months of 1948," Dr. Engelhard stated, "amounted to 259,000 ounces, including approximately 14,000 ounces of platinum and 13,000 ounces of palladium per month according to the latest reports. The commercial importance of palladium is approaching that of platinum and far outranks the four other platinum metals—rhodium, ruthenium, iridium and osmium.

"*Platinum* in the form of platinum-rhodium spinnerets continues to be the heart of the producing equipment in the rayon industry, where viscose solution is extruded through thousands of tiny holes of the spinneret into a corrosive acid bath to produce continuous strands of rayon. A platinum alloy device similar to the spinneret is used in the production of glass fibre, where platinum is used to

(*Please turn to page 238*)

THE *Speed* YOU CHOOSE...

with Any Enclosure A-C. or D-C. Motor!

It's the

RELIANCE GEARMOTOR

You can choose a Reliance GearMotoR to provide any speed from 4 to 1,430 rpm . . . any enclosure in either A-c. or D-c. Reliance *Precision-Built* Motor . . . any horsepower from 1 to 60. For details of this flexibility and the 12 distinctive features built into motor and gear unit which produce an advanced design for superior performance and longer life . . . write today for Bulletin C-404.

★ ★ ★

It will also pay you to have information on Reliance *Precision-Built* A-c. Motors; ask for bulletins describing the complete line. There is a type to meet every requirement from 1 to 200 horsepower—with advantages that have been proved to users in every industry.

Sales Representatives in Principal Cities

RELIANCE ELECTRIC AND ENGINEERING CO.

1056 IVANHOE ROAD • CLEVELAND 10, OHIO

"Motor-Drive is More Than Power"

Here Is Why You Can
REDUCE PROCESS DOWN-TIME

When You Use *Carpenter* STAINLESS TUBING . . .

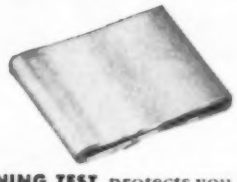
Longer equipment life with less time spent for tube replacement is one result you get by using Carpenter Stainless Tubing. For full corrosion resistance, plus the long service life that consistently uniform tube walls give you, specify Carpenter Stainless Tubing on every order.

And you save money in fabrication, too. Bending, expanding, joining, welding, etc., can be done rapidly to make trouble-free installations.

To prove that your process down-time can be reduced, drop us a line. We will be glad to work with your engineers.

Acid heater with removable bundle of 128 Carpenter Stainless Tubes, 1½" O.D., Type 316. Easy fabrication combined with long service life on process lines is the reason why the manufacturer always specifies Carpenter Stainless Tubing.

YOU GET LONGER EQUIPMENT LIFE with the Stainless Tubing That Passes These Tests—



FLATTENING TEST protects you against the possibility of O.D. defects. Specimen is flattened between parallel plates until distance between plates is 3 times the tube's wall thickness. Any sign of cracking or flaws is cause for rejection.

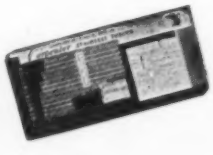
TRANSVERSE BEND is used to double-check the I.D. structure of Carpenter Stainless Tubing. Sample is slit longitudinally and then bent as in the flattening test, but in the opposite direction.

These tests, made at several stages of manufacture, prove quality of the entire tube section and are made on every lot of full finished Carpenter Stainless Tubing before it is released for shipment.

Carpenter

STAINLESS TUBING

"MORE THAN CORROSION RESISTANCE"



STAINLESS TUBING DATA to help you improve your product's performance is a part of Carpenter service. A note on your company letterhead will bring you a copy of the Carpenter Stainless Tubing Slide Chart containing data on physical properties, sizes available, etc.

THE CARPENTER STEEL COMPANY

Alloy Tube Division • 122 Springfield Road, Union, N. J.

Delicious Profits!

WHAT'S cooking in the candy and confectionery business where the one and a half billion dollar annual volume makes delicious profits on the two and a half billion pounds sold? First, is salesmanship — good, old fashioned, hard-punching sales. Second, is *packaging* where more than 175 million *set-up boxes* are used to promote point-of-sale preference for your favorite sweets. . . . and it's one business the little fellow shares with the big companies for 95% of the volume is less than national in scope but the little fellow, pound for pound, buys just as many *set-up boxes*. Why not consider the *set-up box* for more delicious profits.

NATIONAL PAPER BOX MANUFACTURERS Association
AND COOPERATING SUPPLIERS
Liberty Trust Building • Philadelphia, Penn.

Want Additional Product Information? See Page 19.

MILFORD

WAVY SET BAND SAW BLADES

are setting new cutting records especially on horizontal band saw machines everywhere!

Users tell us . . . these Wavy Set blades are cutting better than 30% more metal . . . 50% more they say, on stainless steel . . . than any standard raker set blade. And cutting at closer tolerances!

Why? Just three major reasons tell the story . . .

Individually packed in cartons for easy handling.

FIRST . . . the teeth are set into the back of the saw, which means added strength . . . and practically no tooth rippage.

SECONDLY . . . the wave helps clear the chips from the cutting area . . . resulting in straighter cutting and material increase in blade life.

THIRD . . . made by saw specialists . . . the originators of the WAVY SET BLADE . . . who have incorporated new principles in basic design and heat treatment.

Order from your Mill Supply Distributor. He is always ready to serve your needs for all industrial supplies, including MILFORD hack saw and band saw blades.

You owe it to yourself to test a Wavy Set blade on your own machine . . . right away.

MILFORD
PROFILE AND BAND SAW BLADES
REZISTOR AND DUPLEX HACK SAW BLADES

THE HENRY G. THOMPSON & SON CO.
Saw Specialists Exclusively for over 70 Years
NEW HAVEN 5, CONNECTICUT, U. S. A.

(*Continued from page* 234)

withstand the high temperature of molten glass forced through small holes. Platinum's role as a hard-working metal is further illustrated in mass production of bases for electric light bulbs, where a platinum feeder die puts glass into 40,000,000 bases before the accuracy of the orifice is affected.

"*Palladium* is reaching new heights in popularity as a precious metal for jewelry. It is very similar to platinum in appearance and durability and more articles per ounce are obtained from the lighter palladium which has been used for industrial purposes for many years. The whiteness and reflectivity of palladium enhances the color and brilliance of diamonds and other jewels, and palladium settings have strength to hold gems securely.

"The communications industries are using large quantities of palladium for innumerable electrical contacts. In the synthesis of vitamins, and other products of modern chemistry, palladium catalysts are simplifying processes and reducing costs to consumers.

"*Rhodium*, which possesses greater whiteness and reflectivity than the better known and more abundant platinum and palladium, is an ideal metal for surface finishing as it does not discolor and it resists wear. Although rare and costly, the simplicity of plating operations, plus its ability to do the job with a remarkably thin deposit, bring unit costs into reasonable ranges. Inexpensive costume jewelry and cigarette lighters utilize rhodium finish. Other examples range from rhodium-plated watch movement parts to finished arc light reflectors as used in the motion picture theatre projectors.

"*Ruthenium* is used to harden palladium especially in jewelry alloys in the ratio of about 5% ruthenium and 95% palladium. Fountain pen points utilize the high resistance to wear and corrosion of this element for smooth writing and long life.

"*Iridium* continues to be used in alloy form where a 10% iridium and 90% platinum mixture is the most popular. Alloys of higher iridium content are employed in ignition systems, especially for airplanes.

"*Osmium* is used chiefly in the production of pointing materials that must have great resistance to wear. An example is record-player needles where small highly polished points containing this metal are fused to the needle.

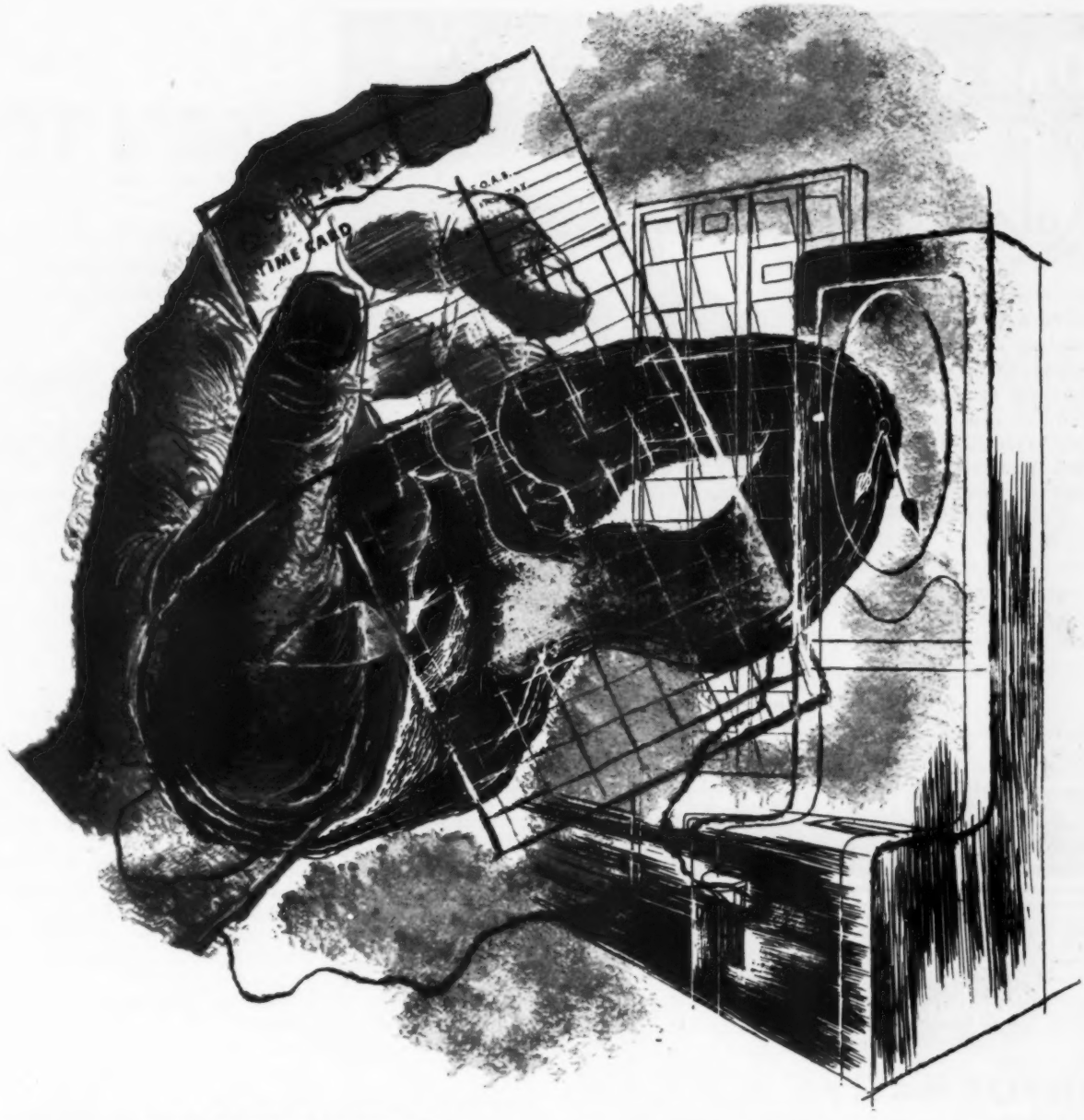
"All the platinum metals are steadily gaining recognition as hard-working metals having high salvage value."

* * *

SYNTHETIC RUBBER STATUS

About a year ago the first government tire tests made from pilot plant cold rubber were completed. The results were greeted with enthusiasm and many assertions were made which created the impression that the synthetic rubber problem was solved. This conclusion must be regarded as somewhat premature, states

(*Please turn to page* 240)



Is this PROFIT THIEF on your payroll?

He's a slick operator. He's at work on machines in plants all over the country retarding production, eating away at profits, costing industry enormous amounts that *can* be saved!

Not in *your* plant, you say? Why not have a look? Today!

Are you still scooping grease from drums to guns with antiquated paddles? There's your profit thief at work —wasting time, wasting grease, risking dirt and contamination.

You can save 3¾ man hours for every 100 lbs. of grease.

Are you lubricating machines by hand—the old, time-wasting, risky, hit-or-miss method?

You can save up to 23.9 man hours in *applying* each 100 lbs. of grease.

Are you paying the price of "down-time" and lost precision for lack of the right grease at the right time?

You can make lubrication foolproof—make sure every bearing gets the right grease in measured amounts every time—even lubricate hundreds of bearings from one central point—while machines continue to produce.

How about it? Is this profit thief loose in *your* plant—on *your* payroll?

His label is "faulty, old-time, costly lubrication methods." Methods that are adding staggering sums to the already high cost of production.

There's one proven way to stop this loss.

An Alemite representative can tell you in 10 minutes how Alemite Methods will simplify and better organize your lubrication procedures. He can show you how mechanized lubrication from barrel-to-bearing will increase your production and profits.

Telephone your local Alemite distributor—or write to Alemite, 1894 Diversey Parkway, Chicago 14, Illinois.

ALEMITE

Another Product of STEWART WARNER

MODERN LUBRICATION METHODS THAT CUT PRODUCTION COSTS

One of 1458 LOAD-FLOATING WORK-SAVING Colson CASTERS

To meet every need exactly, there are 1458 different standard designs of Colson casters—many of them continuously stocked for immediate shipment. Long notable for quality that has made them the replacement choice of industry, they offer you big dividends in faster handling, easier work and reduced floor damage. It pays you to get the facts—write today for free 68 page catalog.

Model No. 3-527-65 swivel fork caster, ideal for use on medium weight industrial equipment. Double row of ball-bearings in hardened raceways; heavy oversize king bolt, patented lock nut. Built for years of rugged service.

THE COLSON CORPORATION

ELYRIA, OHIO

CASTERS • • LIFT JACK SYSTEMS • • INDUSTRIAL TRUCKS

Reyburn's

INFORMATIVE TAGS AND LABELS . . . . . KEEP YOUR PRODUCT MOVING AT THE POINT-OF-SALE

Constantly selling your product . . . telling shoppers of its high quality, what it is made of, what it will do, how to use it, and how to care for it—that's Reyburn's Informative Tags and Labels. They provide immediate point-of-sale information for sales personnel . . . stimulate consumer interest . . . speed up sales. Put this powerful selling force behind your product. Our expert tag and label designers are at your service, without obligation to you. Write today for information.

SEND FOR YOUR FREE COPY OF "REYBURN'S BUSINESS HELPS"

THE REYBURN MANUFACTURING CO., INC.

PHILADELPHIA 32, PA.

BRANCH FACTORY: ROYERSFORD, PA. WAREHOUSE: CHICAGO, ILL.

(*Continued from page 238*)

Dr. H. P. Dinsmore, vice president of the Goodyear Tire & Rubber Company, Akron, Ohio.

There is now a capacity for making this rubber of only about 1200 tons per month, he continued. Many production problems have appeared and only a fraction of this capacity has produced rubber of proper uniformity for test purposes. Some conclusions can be drawn from our increased experience, however.

The rubber gives a very marked improvement in tread-wear as against the old synthetic—perhaps 30%. This would raise it to, or somewhat above the level of natural rubber. However, synthetic has been subject to tread-cracking and this fault develops in slow, hot-weather testing, where we have but little experience, as yet. The tendency to skid under wet, winter conditions is also yet to be determined. These two factors may enhance or off-set the tread-wear advantage over natural rubber. There can be no doubt, however, of the improvement over the old synthetic.

There is no prospect of improved value in large truck tires. The lower elasticity leaves a large gap between the new rubber and natural rubber.

There is some evidence that "cold rubber" latex products such as foamed rubber and wire insulation may have improved toughness. The problem of making a stable latex is still a difficult one.

The rubber is somewhat tougher to process, but gives smoother extruded products with less "swell". Overall processing costs will probably be about the same as for the "cold rubber". The cost of producing the rubber itself should be increased not more than a fraction of a cent a pound.

Rubber Reserve has approved an increase in capacity of about 15,000 tons per month. This will doubtless be increased, if and when the industry shows a willingness to absorb it. The time to complete the production installations will depend largely upon refrigeration equipment deliveries. It may require from six months to a year, with the latter figure more probable.

In conclusion, it may be said that "cold rubber" is a decidedly forward step. It may bring synthetic closer to self-sufficiency. It does not yet appear to have reached that point. Nothing has yet appeared to indicate that synthetic can compete in cost with natural rubber, on a free market, with ample supply.

POWER CRANES & SHOVELS COMMERCIAL STANDARD

Recommended Commercial Standards TS-4721 has been sent to manufacturers and others concerned by the Commodity Standards Division, National Bureau of Standards, Washington, D. C. The purpose of the proposed standard is to provide uniform methods of supplying specification data, requirements and definitions for fair competition, and a better understanding between the buyers and users of power cranes and shovels. The standard is further intended as a guide for a common basis.

COPPER ALLOY BULLETIN

SCREW MACHINE EDITION

REPORTING NEWS AND TECHNICAL DEVELOPMENTS OF COPPER AND COPPER-BASE ALLOYS

Prepared Each Month by Bridgeport Brass Co. "Bridgeport" *Headquarters for BRASS, BRONZE and COPPER*

For Greater Economy and Efficiency of Screw Machine Operation

Bridgeport Offers a Wide Range of Free Cutting Rod Alloys

Metallurgical research and the use of improved and more powerful equipment have brought forth new engineering alloys of exceptional properties which have opened up new opportunities to product designers and mechanical engineers. By using stronger, tougher, more corrosion resisting engineering alloys, it is possible to improve greatly the service life of many fine products now made from outmoded materials. The newer alloys should also be studied for possible use on new products still in the development stage.

Alert Screw Machine departments and operators must therefore be receptive to trying out new materials which naturally bring with them new problems in machining. Outstanding among rod alloys is Duronze* III which is rapidly being specified and which often replaces other metals such as free cutting brass, naval brass, cast bronze, steel, etc.

Because Duronze III is stronger and lighter than naval brass, it can replace the latter at a saving in weight from 40% to 50% on the basis of equivalent yield and tensile strengths. The use of this alloy for marine applications can, therefore, reduce dead weight and space without sacrificing strength or corrosion resistance. When replacing naval brass and manganese bronze for valve stems, Duronze III, in some cases, outwears these alloys several times. It is used for valve parts, wire and cable connectors, nuts, thrust screws, gears, pinions, pump parts, rollers, worm gears, oil burner nozzles and many other items. More complete technical data, numerous charts, tables and applications are found in the DURONZE MANUAL, available upon request.

For everyday requirements calling for dependable fast cutting rod, a number of free cutting brass alloys designed for fast production, precision quality, and maximum economy of operation are listed. Bridgeport rod has many other fine features—accurate gauge, fine surface, uniformly excellent quality.

Bridgeport's Laboratory will gladly help mill customers with their metal problems. For further information write for Bridgeport's 128-page Technical Handbook.

*Reg. U. S. Pat. Off.

RODS FOR SCREW MACHINE OPERATION

		Ledrite Standard	Ledrite (Medium Lead)	Leaded Commercial Bronze	Leaded Naval Brass	Medium Leaded Naval Brass	Naval Brass	Duronze III
ANALYSIS								
Copper	%	60.75	63.0	89.0	60.0	60.0	60.0	91.0
Lead	%	3.40	1.6	1.75	1.75	0.6	.15	
Tin	%				.60	0.6	.75	
Zinc	%	35.85	35.4	9.25	37.65	38.8	39.1	
Aluminum	%							7.0
Silicon	%							2.0
MECHANICAL PROPERTIES								
Ten. Strength psi.	Hard*	58,000	65,000	52,000	73,000	80,000	80,000	100,000
	Soft	49,000	45,000	37,000	55,000	55,000	55,000	85,000
Yld. Strength, psi. (@ ½% exten. under load)	Hard*	45,000	48,000	45,000	52,000	52,000	52,000	50,000
	Soft	18,000	15,000	12,000	25,000	25,000	25,000	45,000
Elongation, % in 2"	Hard*	25	12	18	15	15	15	10
	Soft	53	38	45	35	50	50	30
Rockwell Hardness	Hard*	B78	B80	B58	B78	B78	B78	B95
	Soft	F68	F38	F55	B50	B50	B50	B85
PHYSICAL CONSTANTS								
Melting Pt. (liq.)°F		1650	1670	1900		1640	1650	1810
Density, lbs./cu. in.		.307	.306	.319	.305	.304	.304	.278
Coeff. of Thermal Exp./per °F from 77°F to 572°F x 10-6		11.4	11.3	10.2	11.8	11.7	11.7	9.2
Thermal Conduct. Btu/sq. ft/ft/hr/°F @68°F		67	67	104	67	67	67	20
Elec. Cond. % IACS @68°F Soft		26	26	42	26	26	26	7.0
Mod. of Elas. (Tension) psi.		***	****	****	***	***	***	***
FABRICATION PROPERTIES								
Machinability Rating**		100	90	80	70	50	30	60
Cold Working		P	F	G	P	P	F	P
Hot Working		F	F	P	G	E	E	E
Hot Working Range°F		1300-1450	1300-1500		1200-1400	1200-1400	1200-1500	1300-1600

*Hard temper—values are for Rod of commercial hard drawn temper.
**Machinability Rating—Free cutting brass—100 ***14,000,000 ****15,000,000
E—Excellent G—Good F—Fair P—Poor

BRASS • BRONZE • COPPER • DURONZE — STRIP • ROD • WIRE • TUBING

BRIDGEPORT BRASS COMPANY

General Office: 30 Grand St., Bridgeport, Conn.

Established 1865

"Bridgeport" *District Offices and Warehouses in Principal Cities*

Mills at Bridgeport, Conn. and Indianapolis, Ind.

In Canada:
Noranda Copper and Brass, Limited, Montreal

...HE ANALYZED

Miss Hooper's "Stooper" Rating...

...SHE'S BEEN ON THE LEVEL EVER SINCE!

"Our Miss Hooper was pretty unhappy about the unladylike muscles she was developing on her job—but the real problem was the productive time this stooping, squatting, bending and twisting, chiseled from her working day.

"Happily for Miss Hooper, however, the Diebold Man's study of the 'general work actions' involved on her job revealed this: Eight exhausting motions could be eliminated, enabling Miss Hooper to maintain closer control over increasing work loads—without fatigue!"

The Diebold Man can make *unbiased* suggestions because he can offer *all four* types of record-handling equipment; rotary, visible and vertical filing, as well as microfilm. He knows how the advantages of each are best applied, and best fitted to *your* activities, people, procedures.

Look up Diebold in your phone book, or write Diebold, Inc., 1653 Fifth St., S.W., Canton 2, Ohio.

Even if you are already microfilming records, the new Diebold Flofilm equipment will be of special interest to you, because of its advanced operating and processing features. This is only one of Diebold's record-handling methods.

Diebold ROTARY VERTICAL VISIBLE MICROFILM

RECORD-HANDLING *Systems*

MICROFILM • ROTARY, VERTICAL AND VISIBLE FILING EQUIPMENT • SAFES, CHESTS AND VAULT DOORS • BANK VAULT EQUIPMENT • BURGLAR ALARMS

PRODUCTION EXECUTIVE

Office Equipment and Supplies

Monthly FORMS FORUM

Disbursement Record, and Vendor Record forms, and Stock and Purchase Requisitions, Purchase Order, Price Inquiry and Receiving Report used by Cornell Wood Products

Purchasing Agent L. E. Falbe of the Cornell Wood Products Company, Cornell, Wis., manufacturers of specialty boards, supplied the accompanying forms used by his department for use in the Forum.

These include material and purchase requisitions, purchase order, inquiry form, receiving report, disbursement form, and vendor record card, all of which are conspicuous because of their simplicity and completeness.

It will be noted that the Purchase Order form and the Material Received form, reproduced on the following page, are very similar typographically. The Material Received forms are padded in duplicate, along with the purchase order, and are typed at the same time.

The carbon sheets are so cut that only the names of the articles appear on the Material Received form. The original of this form is forwarded to the Accounting Department, becoming a part of the invoice record, and the duplicate is forwarded to the Purchasing Department for checking against orders. As is obvious, it is necessary for the Receiving Department to actually count, weigh, or measure, etc., the materials received on orders. In event the order is not shipped complete, receipts are reported on separately padded "received" forms which are filled out in longhand by the receiving clerk.

Terms and Conditions

The Purchase Order contract conditions under the words "Very Important" at the bottom of the Purchase Order Form are as follows:

"Mail Invoice in Triplicate and shipping receipt, each showing order number to this office on the day the shipment is made.

"Acknowledge receipt of this order

(*Please turn to page* 246)

CORNELL WOOD PRODUCTS COMPANY
CORNELL, WISCONSIN
PURCHASE REQUISITION

DATE _____
ORDER NO. _____
SHIP TO _____ actual size 8½" x 7-1/4" _____ VIA _____ WHEN WANTED _____
F. O. B. _____ TERMS _____ ACCT. _____

Quantity	Unit	Description	Price	

Ordered By _____ Purchase from _____
Approved _____ Street Address _____
City _____ State _____
By _____ Date _____

CORNELL WOOD PRODUCTS COMPANY
CORNELL, WISCONSIN
PRICE INQUIRY

Actual size 8½" x 7-1/4"

Gentlemen:- Please quote price F. O. B. _____ on the following materials
Quotations will not be considered unless returned on this form.
Quote discounts on all material for which there is regular standard list unless prices requested otherwise.
Cash discount 2% 10th Prox. unless noted otherwise.
Order will be placed _____ L. E. Falbe, Purchasing Agent

Quantity	Unit	Description	Unit Price	Discount
		ACCT.		

THIS IS NOT AN ORDER

When can you ship? _____ _____
Where from? _____ Name of Firm
Give approximate shipping weight _____ Date _____

(*Continued from page* 245)

stating when shipment will be made. If there is any part of the order you cannot furnish, please advise promptly. Do not substitute.

"When invoices subject to discount are not mailed on date of shipment, Discount Period will begin on the date they are received in our office.

"No charge allowed for boxing, packing and cartage.

"The seller agrees to protect and save harmless the Purchaser from all costs, expenses or damages arising out of alleged infringement of patents in the use of the articles covered by this order.

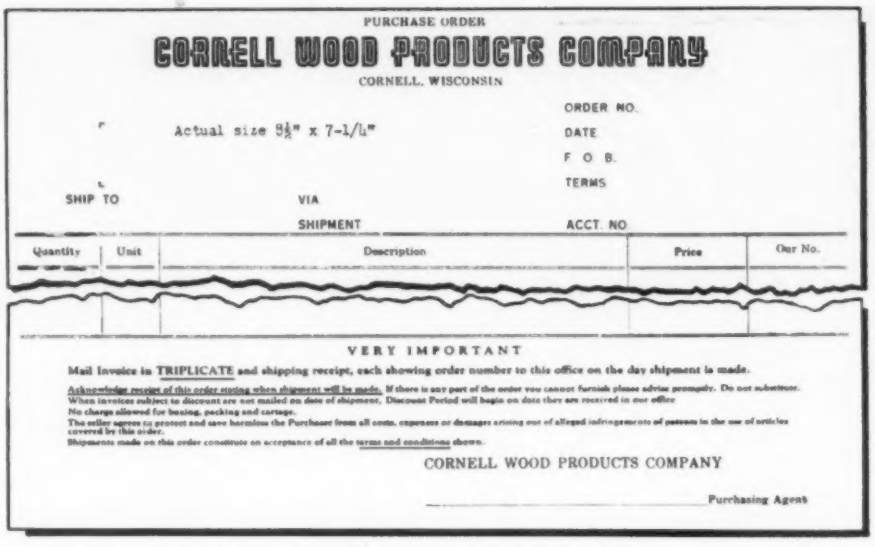
"Shipments made on this order constitute an acceptance of all of the terms and conditions shown."

●

Right: Purchase Order Form, and lower section of the Purchasing Departments copy thereof. Five copies are prepared, two of which are of the Material Received form reproduced below.

The conditions under the words "Very Important" are reproduced in the accompanying text.

●



PURCHASE ORDER

CORNELL WOOD PRODUCTS COMPANY

CORNELL, WISCONSIN

Actual size 8½" x 7-1/4"

ORDER NO.
DATE
F. O. B.
TERMS
SHIP TO
VIA
SHIPMENT
ACCT. NO.

Quantity	Unit	Description	Price	Our No.

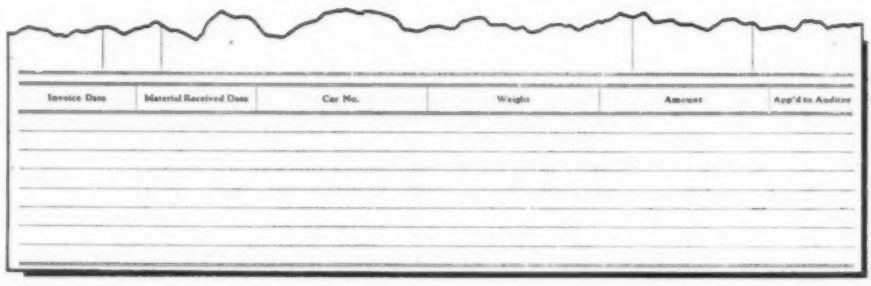
VERY IMPORTANT

Mail Invoice in TRIPLICATE and shipping receipt, each showing order number to this office on the day shipment is made.

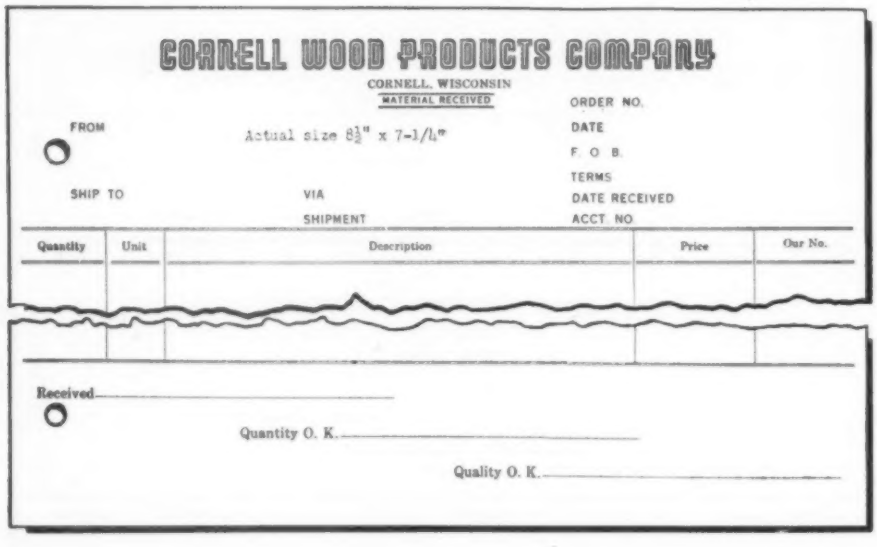
Acknowledge receipt of this order stating when shipment will be made. If there is any part of the order you cannot furnish please advise promptly. Do not substitute.
When invoices subject to discount are not mailed on date of shipment, Discount Period will begin on date they are received in our office
No charge allowed for boxing, packing and cartage.
The seller agrees to protect and save harmless the Purchaser from all costs, expenses or damages arising out of alleged infringements of patents in the use of articles covered by this order.
Shipments made on this order constitute an acceptance of all the terms and conditions shown.

CORNELL WOOD PRODUCTS COMPANY

_____ Purchasing Agent



Invoice Date	Material Received Date	Car No.	Weight	Amount	App'd to Auditor



CORNELL WOOD PRODUCTS COMPANY

CORNELL, WISCONSIN

MATERIAL RECEIVED

FROM

Actual size 8½" x 7-1/4"

ORDER NO.
DATE
F. O. B.
TERMS
SHIP TO
VIA
DATE RECEIVED
SHIPMENT
ACCT. NO.

Quantity	Unit	Description	Price	Our No.

Received _____

Quantity O. K. _____

Quality O. K. _____

●

The Material Received Report is written at time Purchase Order is written, the carbons being so trimmed that quantity is not shown, making it necessary for receiving department to count or weigh shipments received. Original is sent to Accounting Department and copy is sent to the Purchasing Department.

●

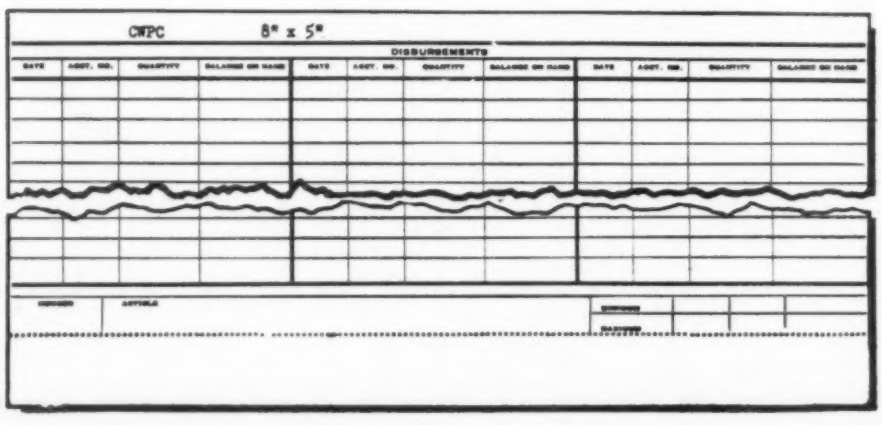
●

Disbursement Form

This form constitutes a material record and stores record card, and it also contains a running inventory.

The Stores Record Department is adjacent to the Purchasing Department, and hence this and other records they may be interested in are readily available.

●



CWPC 8" x 5"

DISBURSEMENTS

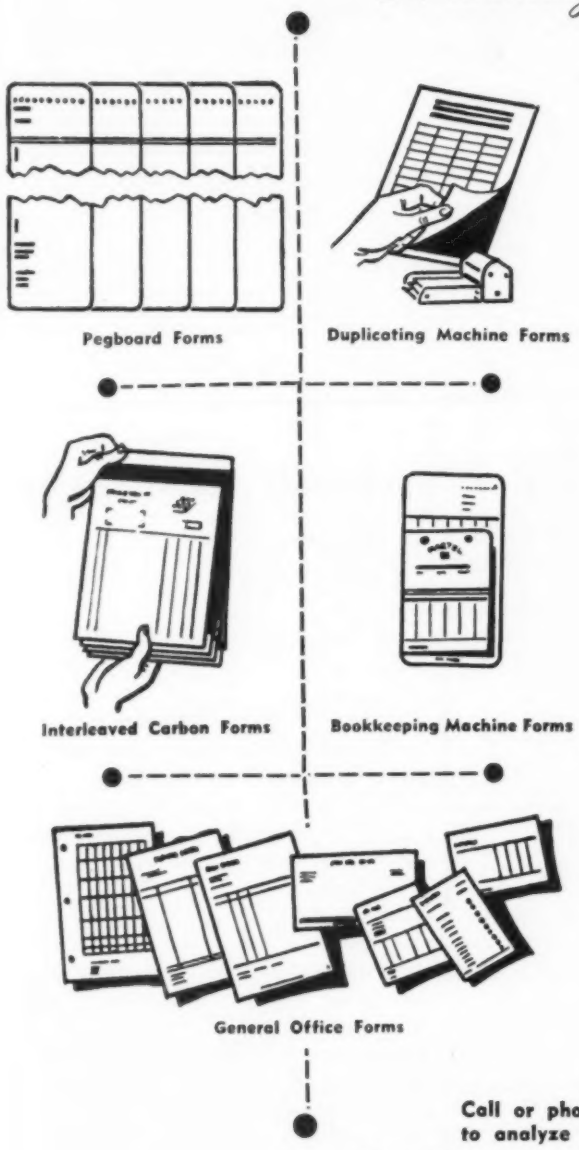
DATE	ACCT. NO.	QUANTITY	BALANCE ON HAND	DATE	ACCT. NO.	QUANTITY	BALANCE ON HAND	DATE	ACCT. NO.	QUANTITY	BALANCE ON HAND

(*Please turn to page* 248)

Pre-printed Master Forms Shoot Up Efficiency of Spirit Duplicating Machines on Many Operations

Expert Printers of These Forms Invite Companies To Submit Any Duplicating Problem For Immediate Solution Without Obligation

Mercury **PRINTING COMPANY**



has made a complete study of the gelatin and spirit duplicating methods, has printed many millions of master units. (Definition: The master unit comes to you with the form and constant information printed on it. Variable information is then written or typed in and sheet is run off on blank copy paper.)

To turn out a proper pre-printed master takes a good deal of experience and knowledge. We have both! If you are running into any difficulty—or if you're always on the lookout for possible improvements—call us in to help you. Our specialists can make an impartial analysis of your system and be most helpful on your duplicating problems.

Call on Mercury for every forms requirement

We maintain a complete advisory staff of forms experts. These men have heavy experience in . . . and thorough knowledge of . . .

Farm analysis, design and printing
Office system improvement
Modern office efficiency methods and equipment

Combining *their* experience and knowledge with *yours,* our staff can contribute much toward simplification of your office paper work . . . through intelligent use of money-saving, time-saving forms.

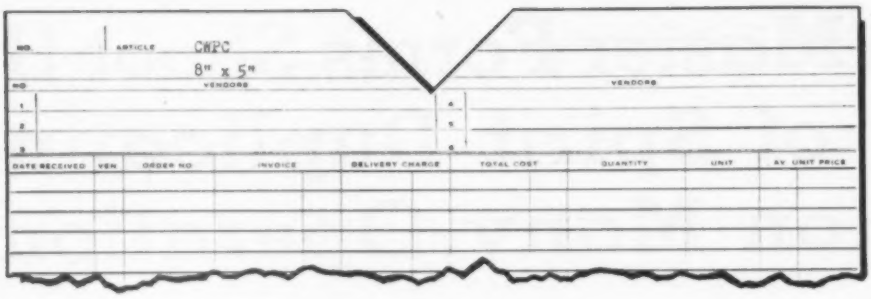
Important, too, is the actual *printing* experience of these men. This experience enables them to suggest slight changes in form construction that can often save many dollars of printing costs. We are equipped to print your forms at lowest possible cost, are famous for *immediate delivery* on both large and small quantities. Give us the chance to estimate your next job.

Call or phone us TODAY. One of our experts will come over at your convenience to analyze your forms requirements or estimate your job. No obligation whatever!

Mercury **PRINTING COMPANY**

200 Hudson Street New York 13, N. Y. • WAlker 5-5604

Want Additional Product Information? See Page 19.

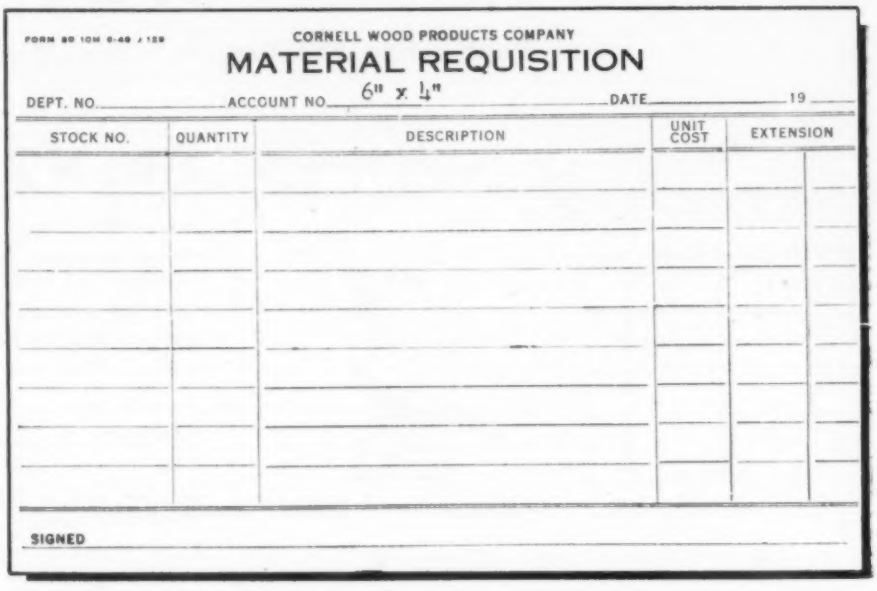


(Continued from page 246)

Vendor Record

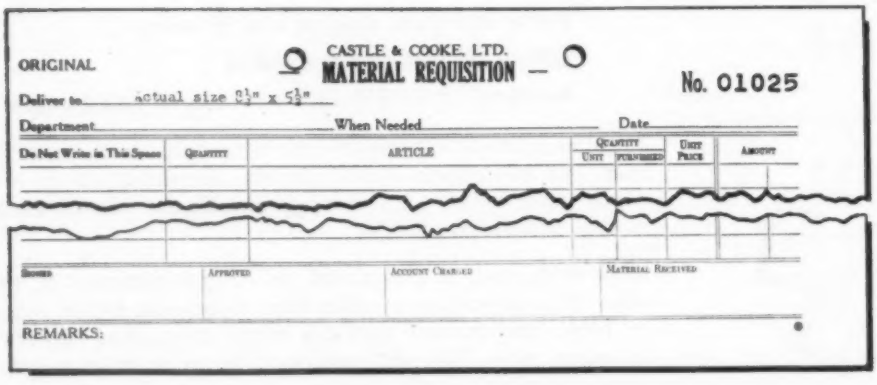
The Vendor Record card is the top card in Cornell Wood Products Company's Kardex file, on all items that are carried. It is an 8" x 5" form.

This is the Material or Stores Requisition form used by Cornell Wood Products departments. This is a 6" x 4" form. It provides spaces for indicating number of using department, and also the account to which the material is to be charged.



Purchase Order Forms Used by Hawaiian Company

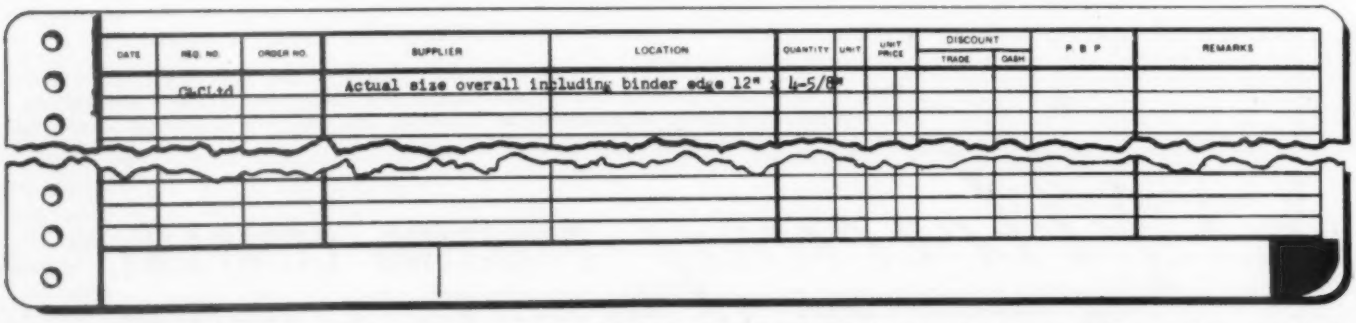
The following forms were supplied for Forum use by J. W. Kiehlbauch Purchasing Agent, Castle & Cooke, Ltd., Honolulu, Hawaii



Material Requisition

This form is used by plantation units and also by Castle & Cooke, Ltd. as a local stores requisition, and it is also used by the parent office as a purchase requisition.

(Please turn to page 250)



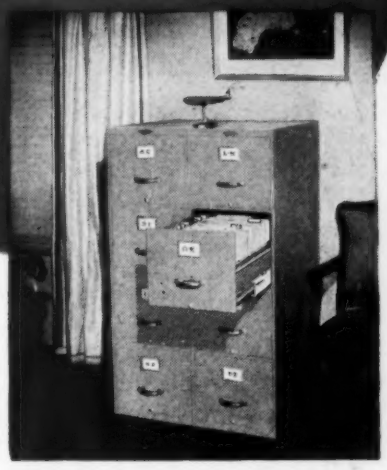
Price Record Card. It is binder filed, and has an over-all length of 12". It provides buyers with complete record of previous purchases.

lighten your office...

LIGHTEN YOUR WORK!

with *Aristocrat* FILING CABINETS

IN DISTINCTIVE "GRAY-RITE"

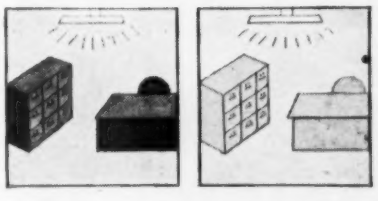


Color-Engineered

for BEAUTY—

Softly gleaming, rich GRAY-RITE enamel finish imparts thrilling new beauty to office surroundings—it's the filing cabinet with the "decorator look." Aristocrat is arousing admiration everywhere: with office personnel, customers, management. You feel *better* when you work and do business in light, harmonious surroundings.

for SIGHT-SAVING—



Unlike dark finishes, which absorb light, GRAY-RITE sends light back into the room, softened and diffused, in just the right intensity for eye comfort. This smart, new finish reflects *virtually twice* as much light as traditional olive green—decreases eye fatigue too by reason of lessened contrast between work surfaces and white papers and documents.

for ADAPTABILITY

Your Aristocrat files in GRAY-RITE blend perfectly with other filing cabinets already in use in your office. GRAY-RITE takes on a delicate tinge of whatever color is next to it: green, brown or mahogany—while becoming even more attractive itself, it creates new color harmony with its "neighbors."

Free!

• The new Aristocrat filing cabinet possesses all the traditional superiorities of this distinguished line, plus *numerous improvements*: it's even sturdier, still more easy to operate, has many additional years of trouble-free wear built into it. Available in 2, 3, 4 and 5-drawer heights in letter and legal size, plus a complete range for all sizes of paper and card records.

Get the complete story on how Aristocrat will beautify your office, lighten your work, save you money—send for FREE brochure LB 356 *The Mark of Quality and Distinction in Steel Files*. Call our office nearest you, or write Systems Div., 315 Fourth Ave., N. Y. 10.

Copyright 1949 by Remington Rand Inc.

Remington Rand The FIRST Name In Office Equipment

(*Forms Forum—Continued from page 248*)

FORM 976

CASTLE & COOKE, LIMITED
HONOLULU, HAWAII

PURCHASE ORDER
ORDER NO. 14853

TO.
actual size 8½" x 5"

REQN. NO.
SHOW THESE NUMBERS ON INVOICES, PACKAGES AND DOCUMENTS

ATTN. OF.

FURNISH INVOICES IN QUADRUPLICATE (4 COPIES). ONE (1) COPY MUST ACCOMPANY GOODS. PROMPTLY SEND OTHER THREE (3) COPIES TO OUR OFFICE. P. O. BOX 2990.

DATE

SHIP TO:

CONF.

SHOW THIS MARK ON YOUR INVOICE

FURNISH NO GOODS WITHOUT WRITTEN ORDER UNLESS CONFIRMED BY THIS DEPARTMENT. MAKE NO SUBSTITUTION WITHOUT OUR AUTHORITY.

PURCHASING DEPARTMENT
PHONE 1221

Purchase Order—Confirmation: Mr. Kiehlbauch states that all Castle & Cooke local orders are placed by telephone, later being confirmed in writing by this form. Five copies are made, one for vendor, one for the warehouse—consignee, office copy—consignee, and subject and numerical file copies for the Purchasing Department. Vendor is instructed to furnish invoices in quadruplicate.

K S-48

KOHALA SUGAR COMPANY
REQUISITION FOR MATERIALS

No. 04270

Date

Purchasing Agents
CASTLE & COOKE, LIMITED, HONOLULU
Please Purchase the Following for our Account:

Required

ORDER NO.	SUPPLIER	QUANTITY	DESCRIPTION	PRICE
			Actual size 8½" x 5"	

Appropriation

By

Plantation requisition used by the Kohala Sugar Company to order materials for its specific use from the Honolulu office.

C & C - 101

REQUISITION

CASTLE & COOKE, LIMITED
HONOLULU, HAWAII

No. 04864
S. F.

SAN FRANCISCO OFFICE

DATE

PLEASE PURCHASE THE FOLLOWING ITEMS:

SHIP

actual size 8½" x 11"

✓	QUANTITY	ITEMS	PRICE

MARK:

FOR

A/C No.

PURCHASING DEPARTMENT

Known as the San Francisco Office requisition, this form is used for ordering materials that cannot be procured locally, or where price and delivery make it advantageous to procure the material through the San Francisco office.

EBERHARD FABER

1849 EBERHARD FABER Centennial 1949

Entering our second century of leadership

When a name has appeared for a hundred years on something used every day...

Like a pencil...

That time-honored name becomes your guaranty.

MONGOL STAYS SHARPER LONGER*

*Scientific laboratory tests prove point-sharpness superiority for the exclusive MONGOL Complastic lead—over the average of all well-known pencils in the MONGOL price range.

SAY **MONGOL** TO YOUR DEALER

Modern business finds thousands of uses for Cellophane—and the many other discoveries of the chemical industry.

Chemistry? Here, too, Moore cuts costs

Wherever there's business—of any kind—you'll find Moore business forms efficiently at work.

The smallest businesses save. For example: Moore designed a 4-part invoice-order form, for a wholesale grocer in Texas, that also gave a dray receipt and office copy *in one writing.* It saves approximately $2000 a year! Great firms choose Moore multi-part forms, too, and end costly waste motion. Moore offers *the right business form for every form of business!*

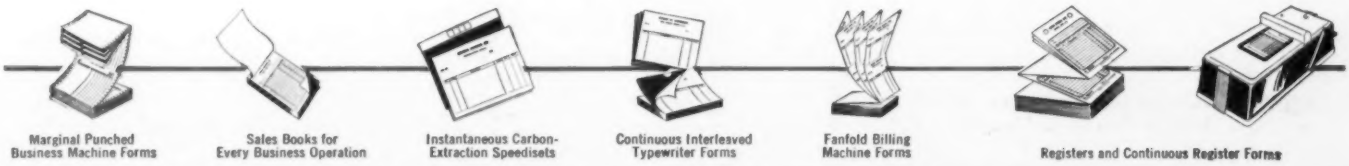
Get airtight controls in *your* business—and cut overhead, too! Just call your local Moore office, in over 200 cities from coast to coast. Or write any Moore factory at: Niagara Falls and Elmira, N. Y.; St. Paul, Minn.; Denton, Tex.; Los Angeles and Emeryville, Calif.; Salem, Ore. Also sales offices and factories across Canada.

MOORE

BUSINESS FORMS INC.

THE ONLY NATIONAL COMPANY THAT OFFERS A COMPLETE RANGE OF MODERN BUSINESS FORMS—

THE RIGHT BUSINESS FORM FOR EVERY FORM OF BUSINESS!



Marginal Punched Business Machine Forms | Sales Books for Every Business Operation | Instantaneous Carbon-Extraction Speedisets | Continuous Interleaved Typewriter Forms | Fanfold Billing Machine Forms | Registers and Continuous Register Forms

BUY DIRECT FROM MANUFACTURER

SAVE ON CATALOG MAILING ENVELOPES

(The Backbone of your envelope needs)
3 styles that take catalogs and important bulk matter

• Plain Flap
• Bull Grip String and Button
• Burrless Metal Clasp (no gum flaps)

FOR QUOTATIONS — CLIP AD TO SAMPLE of present envelopes and send directly to Equitable. State approximate annual requirements.

America's leading publishers and catalog users specify Equitable large mailing envelopes. Quality is right; price is right because they're made right in Equitable's own mill, from stock to finish.

Equitable PAPER BAG COMPANY Inc.
Mills at Orange, Tex.
47-00 THIRTY-FIRST PLACE
LONG ISLAND CITY 1, N.Y.

DON'T FILE IT— Hang it!

IT'S SUSPENDED
NOT SUPPORTED

in Oxford PENDAFLEX* hanging folders

For faster, easier, more efficient filing at a lower cost—try Pendaflex.

No new cabinets needed — simple frame fits in file drawers! Filing changes from laborious research to instant reference!

Drop us a card and we'll send name of nearest dealer. *Reg. U. S. Pat. Off.

Oxford FILING SUPPLY CO., Inc.
Garden City, N. Y.

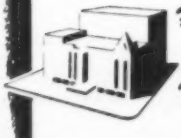
COMING TO CLEVELAND

NEW
VISIT THE HOLLENDEN... COMPLETELY REDECORATED!

★ 1000 ROOMS WITH BATH
★ RADIO IN EVERY ROOM
★ SIX FINE RESTAURANTS
★ CENTRAL DOWNTOWN LOCATION
★ GARAGE ATTACHED

HOTEL HOLLENDEN

Robert P. Joyce, General Manager



Home of the famous Vogue Room

CHART SHOWS 1949 POSTAL RATES

New chart of postal rates and information, complete with all changes effective January 1st, is available from Pitney-Bowes, Inc., Stamford, Conn. Covering all classes of mail and typographically designed for reading ease and accuracy, it is printed in three colors on card stock. It folds for filing convenience and opens up into a 12" x 18" wall chart.

An exclusive feature is a side-by-side listing of all air and surface postal rates in a single weight-zone table, providing an instant cost comparison. Use of color tints on the tables eliminates confusion over rates that may arise when sending parcels (fourth class mail) by first class mail.

TURNEY NAMED ASSISTANT TO GEN. SALES MGR. OF IBM

International Business Machines Corporation, New York, announces the appointment of Lester Turney as assistant to the general sales manager. He previously was manager of customer engineering. Mr. Turney has just become a member of the IBM Quarter Century Club through the completion of 25 years of continuous service with the company. He is succeeded as manager of custom engineering by M. R. Dilling.

J. Lester Turney

ROYAL TYPEWRITER COMPANY ANNOUNCES PROMOTIONS

David B. Starrett, vice president in charge of sales for the Royal Typewriter Company, New York, recently announced the following managerial promotions:

Philadelphia: W. A. Eiseman, former district manager at Cincinnati, has been named district manager.

Cincinnati: Lloyd G. Roberts, former district manager at Omaha, succeeds Mr. Eiseman as district manager.

Omaha:: Donald L. Newell, formerly manager at Cedar Rapids, succeeds Mr. Roberts.

Milwaukee: G. A. Broden, formerly manager at Worcester is new district manager.

Cedar Rapids: Thomas P. Kelly, formerly of Chicago, has been named district manager.

(*Please turn to page* 254)

bring your layouts to life...

print on *Ticonderoga Text* and COVERWEIGHT

INVITING is the word—for *any* job done on watermarked Ticonderoga Text! Distinctive yet not expensive, this International paper can be used for every printing process. Laid or wove finish, deckle or plain edge, seven colors plus cream and brilliant white.

For double success, team it up with Ticonderoga Coverweight!

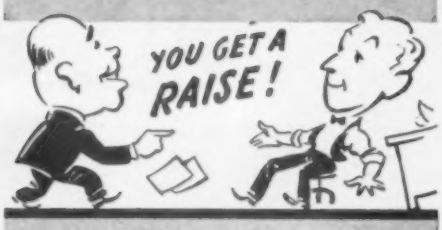
International Paper Company, 220 East 42nd Street, New York 17, N. Y.

INTERNATIONAL PAPERS

for Printing and Converting

Want Additional Product Information? See Page 19.

"I want to talk to you! About the smoothest, speediest filing system this office ever had with that SEA FOAM BOND you recommended . . .



"For streamlining our office system . . . for getting us a thin business paper that comes clean with erasures—and even makes 14 clear carbons in one typing. The girls love it.

"SEA FOAM'S thinness cuts our file space in two . . . and every sheet *stands up*, findable, in the files. It really likes hard handling, too. You're the

BEST P. A. WE'VE EVER HAD!

SEA FOAM BOND

America's Favorite Lightweight Office Paper

Sold by leading paper merchants and stationers nation-wide.

Brownville Paper Company
5 Bridge St. Brownville, N. Y.

I'd like to see what Sea Foam Bond can do for us . . . and me. Please send me a free sample kit

Name_____

Company_____

Address_____

_____

ADDRESSOGRAPH-MULTIGRAPH DEVELOPS PURCHASING AID

A new Addressograph development that will introduce to purchasing department procedures an important cost-cutting time-reducing improvement is announced by the Addressograph - Multigraph Corporation, Cleveland, Ohio.

The unique development is being marketed as the "Cardoplate Self Writing Record", according to G. C. Brainard, president and general manager. It embodies the use of a light-weight embossed metal plate which can be attached to standard accounting forms, making it possible for the first time in accounting history to add the mechanical "mass typing" features of an Addressograph plate to the conventional functions of a basic accounting record. It introduces accurate, mechanical processing of data and enables users to transcribe key information about persons, products or services instantly on any business form, directly from a posted record at point of use.

Addressograph-Multigraph's new Model 125 Addressograph, especially designed for use with its new Cardoplate Self Writing Record. This machine is portable and can be used on any desk, table or stand.

In conjunction with the Cardoplate self-writing unit, the company is also introducing a portable transcribing unit to be known as Addressograph Model 125. This machine is smaller than a typewriter and can be operated on any convenient stand, desk or table. It accommodates forms ranging from four inches to 8-11/16th inches wide and of unlimited length. The transcriber has the same single stroke operation that characterizes other Addressograph-Multigraph transcription machines. In addition, it is equipped with several design features which further simplify the Cardoplate operations. For instance, it has instantly adjustable gauges for registering top and side margins, ribbon inked on one side only to prevent ink from depositing on Cardoplate type characters and then offset to forms.

Records equipped with the new Cardoplate units can be used in any front feed or flat bed accounting machine, Mr. Brainard declares, and in all manual procedures without changing present accounting routines or filing methods. The new development is applicable to all lines of business, wherever information must be copied and recopied.

Purchasing departments can use the new Cardoplate unit in many ways. For example, prior to the issuance of bids or

(*Please turn to page* 256)

Where to get NEW ITEMS— NEW SOURCES OF SUPPLY... quick

A specialized buying directory designed and built for production, purchasing and engineering executives—to assist them, in the easiest manner, to secure sources of supply for all equipment, products or supplies used by industry.

Compact, complete and yet easy to handle—that's CONOVER-MAST PURCHASING DIRECTORY.

Five separate sections make up this directory—A CLASSIFIED SECTION, containing the names and addresses of manufacturers classified by product—A TRADE NAME SECTION, listing alphabetically the trade name of the product with name and address of the manufacturer—An ADDRESS SECTION, giving the names and addresses of American manufacturers—A CHEMICAL SECTION, listing by product the name and address of important manufacturers—A MECHANICAL DATA SECTION, giving 34 pages of helpful tables, formulas, etc.

Use CONOVER-MAST PURCHASING DIRECTORY! You'll really like it.

If by chance you haven't a copy, write us. We want every industrial buyer to have the benefits of this handy purchasing reference.

Incidentally, mentioning CONOVER-MAST PURCHASING DIRECTORY, when sending out inquiries, means much in helping to increase our service to you.

Reach for ➡ Keep it Handy

Conover-Mast
PURCHASING DIRECTORY
333 N. Michigan Ave., Chicago 1, Ill.
A Conover-Mast Publication

FORMERLY PLANT PURCHASING DIRECTORY

Your people Who Use Forms

are only as good as the forms they use...

save Their time and Your money with UARCO *business forms*

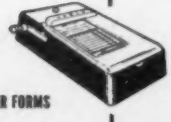
If your people have to mess with carbons when they write a form . . . if copies aren't put into the right hands fast . . . if clerks make errors in re-copying . . . that may well be the fault of the form rather than your personnel. *They* can't do anything about it.

But *you* can! You can simplify their jobs with Uarco business forms. Then one writing makes a copy for all concerned. No waiting. No re-copying. Your people then can and will make the most of their time . . . *and your money!*

Like to know which Uarco forms are best for your specific operation? Call in a Uarco Representative. He'll make a complete survey of your business requirements—no cost, no obligation.

SINGLE SET FORMS

CONTINUOUS-STRIP FORMS
FOR TYPEWRITTEN AND BUSINESS MACHINE RECORDS



AUTOGRAPHIC REGISTERS AND REGISTER FORMS

UARCO, INCORPORATED
Chicago, Ill.; Cleveland, Ohio; Oakland, Calif.; Deep River, Conn.
Offices in All Principal Cities.

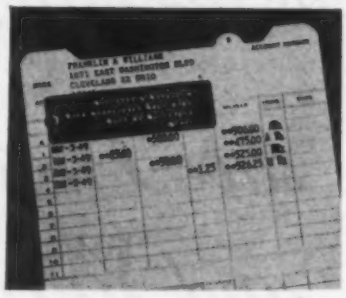
for instance *. . . the Uarco Representative may suggest Speed-O-Forms. In five seconds, Speed-O-Forms turn any typewriter into a continuous billing machine . . . the girl has only to type. Speed-O-Forms are consecutively numbered and varicolored for easy distribution and filing.*

UARCO INCORPORATED *Business Forms*

Whether you're
. . . Short
. . . Medium
. . . or Distance Runner
consider . . .
SHEPCO SHORT, MEDIUM
AND LONG RUN ADVANTAGES
Sheppard
ENVELOPE CO.
No. 1 Envelope Terrace
Worcester 4, Massachusetts

(*Continued from page* 254)

the preparation of purchase orders themselves, it is usally necessary to refer to a vendor's ledger file. This is done in order to determine the proper sources of supply and the best terms and delivery possible. The Cardoplate system provides a fast, simple method of processing the bid requests or the purchase order forms direct from the vendor records.



Known as the "Cardoplate Self Writing Record," this new product is designed to eliminate repetitive writing in many bookkeeping operations, thus saving additional time and money.

The new system also offers important advantages in the processing of installment collection records, material requisitions, accounts payable, delivery and invoicing forms, billing forms, mail order forms, statements and a wide variety of others. It can facilitate the handling of hospital and clinic records, membership cards, billing notices of social and fraternal organizations, solicitation records, sales memos and many others, Addressograph-Multigraph studies reveal.

The Cardoplate capacity is four lines of .166-inch spacing, giving 25 characters at 12 to the inch in each line. The plate itself is 2-¾ inches long and 13/16 inches wide.

1 1 1

McBEE COMPANY NAMES MONTREAL SALES MANAGER

J. W. Bryers has been named manager of the sales office of the McBee Company in Montreal. An associate of the McBee Company, The McBee Company, Ltd., has a plant at 205 Vitre St., Montreal, where Mr. Bryers maintains his office. Mr. Bryers joined the company shortly after the end of the war. He had served for almost six years with the Canadian Intelligence Corps.

1 1 1

EDISON APPOINTS SALES MANAGER FOR NEW YORK

Appointment of Austin Cunningham as sales manager of the New York area is announced by the Ediphone Sales Division of Thomas A. Edison, Inc., West Orange, N. J. Mr. Cunningham joined the Edison Industries in March 1945 as assistant to the vice president and sales manager of the Ediphone Division. Since January 1948 he has been national assistant sales manager.

in the BEST PLACES
ON MERIT ALONE

Spirit and Hektograph Carbon
Master Units
Dupliforms (Printed Master Units)
Carbon Paper
Non-Curl Carbon Paper
Inked Ribbons
Carbon Paper Ribbons
Carbon Paper Rolls
Stencil Duplicator Inks
Duplicating Fluid
Hand Cleansing Cream

Old Town
RIBBON & CARBON CO., INC.
FACTORY AND GENERAL OFFICE
750 PACIFIC ST., B'KLYN 17, N. Y.
Foremost makers of Ribbons and Carbons for Every Use
Sales and Service Everywhere
PACIFIC COAST OFFICE
843 S. LOS ANGELES ST.
LOS ANGELES 14, CALIF.

Fine Diamonds

Selections sent for inspection without obligation.

L. & C. MAYERS CO.
Diamond Merchants since 1912
545 FIFTH AVENUE, NEW YORK 17, N.Y.

"Take a letter to MYSELF!"

SUCH AN IDEA is not as foolish as it sounds. *You* see your letters with a friendly eye. *You* see your letterhead as an old familiar favorite. But how do your letters and your letterheads look when they arrive in the morning's mail—the way your friends and customers see them?

Whether or not you send a letter to yourself, examine your letterheads with a coldly critical eye. Then visualize them, redesigned if necessary, as they would appear on HOWARD BOND. This excellent bond, whether in whitest white or in a suitable color, brings letters and letterheads to life, gives them interest, smartness, and appeal.

Thousands of America's successful businesses write their valued correspondence on HOWARD BOND. Thousands more use HOWARD BOND for many of its other important business uses. Ask your printer or paper distributor for samples and see for yourself why HOWARD BOND is so widely used wherever good bond is good business.

HOWARD PAPER MILLS, INC. • HOWARD PAPER COMPANY DIVISION, URBANA, OHIO

Howard Bond

"The Nation's Business Paper"

Brooms for Bosses?

After all, there's a place for everything! There is a place in business for an authoritative, commanding letterhead bond. But when the job is office or factory forms, inter-office memos, copies, or any utility business printing, a thrifty, serviceable bond is the practical buy. Such a bond is *Maxwell Bond*. Low in initial cost, it prints so well and works so well with pen, pencil, and typewriter that you'd judge it to be much more expensive. Clean erasures and clear carbons on *Maxwell Bond* convince you of its economy in use. What's more, its watermark guarantees quality and uniformity of these characteristics.

Maxwell Bond

WATERMARKED

America's Favorite Low-Cost Bond

Howard Paper Mills, Inc. • **Maxwell Paper Company Division** • **Franklin, Ohio**

PRINTING CALCULATOR ANNOUNCED BY REMINGTON RAND

A new Printing Calculator, the completely electrified Model "97", with increased capacity up to a trillion dollars, has just been announced by Remington Rand Inc., 315 Fourth Ave., New York, N. Y.

According to the manufacturer, this new machine has all the advantages of both calculator and adding machine, *plus* printed proof of accuracy. All factors and answers of every problem are automatically recorded on the tape, providing an immediate accuracy check and a permanent printed record for future reference. The "97" multiplies and divides automatically, adds and subtracts, and with the printed tape, can also be used for listing. In every calculation, the machine completes the problem and clears the keyboard automatically.

"Short-cut" multiplication is introduced in the new "97". By means of an added feature key, the number of cycles required to complete large-digit multiplication problems is reduced close to 50%, thereby effecting large savings in time.

Standard features include the 10-key keyboard which eliminates 71 unnecessary keys and facilitates touch-method operation by even untrained personnel. Built-in steel cushions absorb machine noise and vibration, and there is a wide, flat paper table for making notes on the tape. A value scale and column indicator speed accurate evaluation of all figures on the tape.

Decimal pointers which may be pre-fixed quickly locate the position of the decimal in any problem, and an electrified decimal key prints the decimal on the tape. Back space and correction keys clear the keyboard one digit at a time or all at once. With its ability to solve every type of figuring problems rapidly and simply, the "97" can profitably be used on hundreds of applications in the offices of every type of modern business.

1 1 1

NEW POSTAL SCALES MEET 1949 REQUIREMENTS

New postal scales designed to include all changes in U. S. postage rates effective January 1, 1949, are being marketed by Commercial Controls Corp., 640 Culver Road, Rochester, N. Y.

The new model 100 letter scale, 20 ounce and 3 lb. capacity, automatically computes postage first class, air mail, third class, and air and surface parcel post. Feature of the scale is its V-type

(*Please turn to page* 260)

Carries a heavy load!

Like a magic carpet, Webster's Micrometric Carbon Paper gives secretaries a real lift. They fly through their work with the greatest of ease — thanks to Micrometric — the only carbon paper with a numbered scale. Micrometric is helping secretaries from coast to coast to turn out more evenly spaced letters and reports.

As a P. A., you will find all F. S. Webster products are packed with extra values. Make it a regular part of your office routine to call for Webster when you need any one of these high-quality products: carbon papers and typewriter ribbons; duplicating carbon papers and accessories; ribbons and carbons for Elliott-Fisher, Addressing, Adding and International Business Machines. Consult your nearest dealer or write to F. S. Webster Co., 7 Amherst Street, Cambridge 42, Massachusetts.

WEBSTER'S

MultiKopy Micrometric Carbon Papers and Typewriter Ribbons

Webster's warehouses in key cities from coast to coast:
New York, Philadelphia, Pittsburgh, Detroit, Chicago, San Francisco, Cambridge

BETTER FORMS?
Rising is Right! Here's Why

Rising Bond forms have the printing surface and the rag content that mean clear and legible printing on strong paper. Your printer will advise that the best form paper "buy" is undoubtedly—

Rising Bond

✓ 25% rag ✓ white and 5 colors
✓ envelopes in 6 sizes ✓ 4 weights
✓ excellent printing surface for engraving, lithography, gravure or letterpress

Write for sample brochure to BoxP.U.-2,Rising Paper Company, Housatonic, Massachusetts.

WHEN YOU WANT TO KNOW . . . GO TO AN EXPERT!

Rising Papers

Rising Papers

ASK YOUR PRINTER . . . HE KNOWS PAPER!

Rising Paper Company, Housatonic, Mass.

At 9 out of 10 of the largest and most important decision points in American industrial purchasing, MacRAE'S BLUE BOOK is used as a reference source "principally" or "exclusively."

Send for your copy of a new survey result booklet, "Where Orders Originate."

MacRAE'S BLUE BOOK

18 E. Huron Street, Chicago 11, Illinois

(*Continued from page 259*)

platform which holds envelopes and packages of any size or shape, including mailing tubes.

Previously serving as a strictly parcel post scale, the use of the new Model 970 70-lb. capacity, has been extended to include postage computations on third class, book rate, and air as well as surface parcel post.

New All-Purpose Postal Scale, 30-lb. capacity, computes postage on first class, air mail, third class, surface and air parcel post. These are low, compact cylinder-type scales with illuminated dial and double indicator wires extending across the chart surface to assure easy and accurate reading.

DISC EDISON VOICEWRITER ANNOUNCED

A new dictating instrument, the Disc Edison Voicewriter, with companion unit, the Disc Edison secretarial instrument, is announced by Thomas A. Edison, Inc., West Orange, N. J. The instruments use seven-inch vinylite plastic disc records which will hold 30 minutes of dictation,

Placing the seven-inch erasable plastic disc in the machine is simplicity itself.

the application of which is merely a matter of inserting the disc in the unit as shown in the accompanying illustration.

The new machine is featured by what is styled the "Ear-Tuned Jewel Action" or diction control, which is accomplished by a special electronic circuit that makes the speaker's voice unusually distinct. Hard-to-hear sounds like the "d" in clocked or the "z" and "th" in zither are reproduced with clarity.

A motor-rectifier-control system in the instrument operates a constant current motor permitting operation on a-c or d-c, with uniform recording from the outside to the inside of the disc. A special erasing service is available to users, so that the cost of discs will average about 6¢. Printed matter describes the new units in detail.

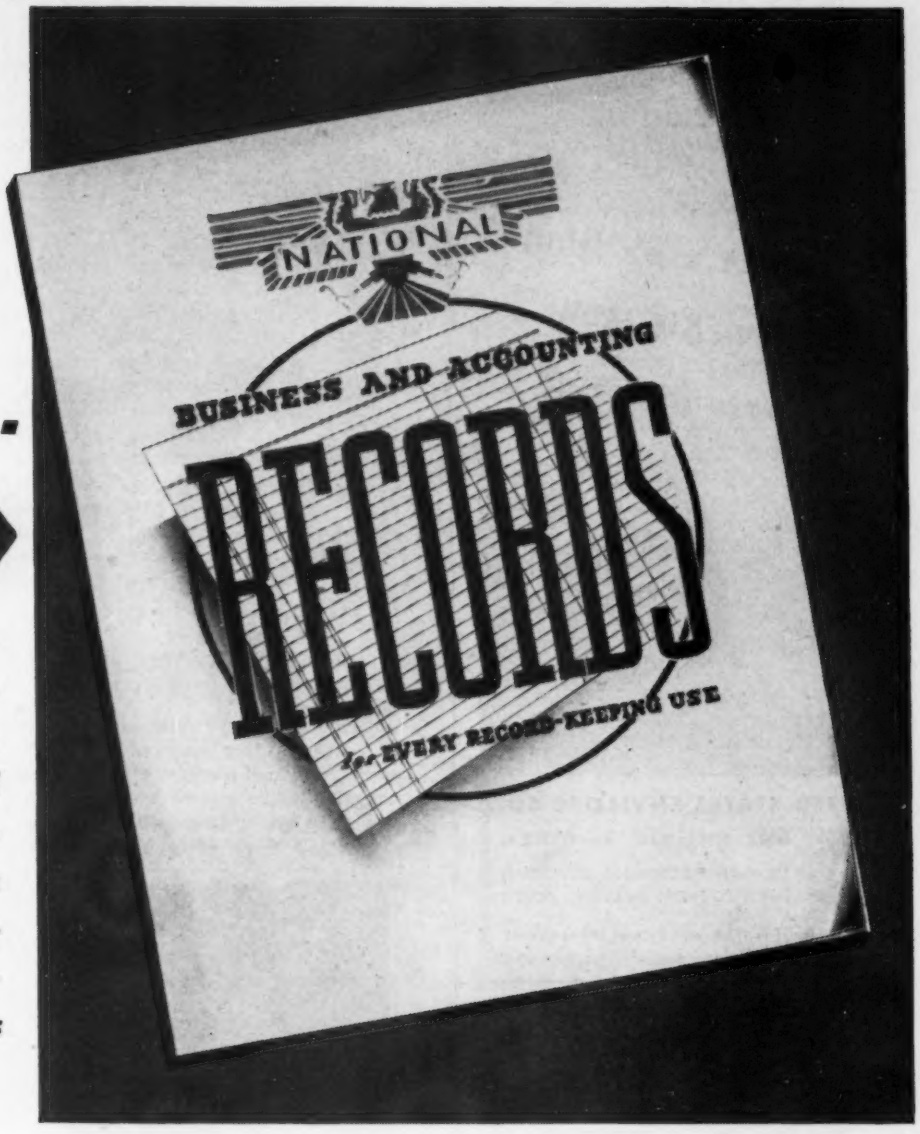
STRATHMORE PAPER COMPANY HOLDS ANNUAL ELECTION

Nelson Feeley, in charge of the home sales office and export sales manager of the Strathmore Paper Co., West Springfield, Mass., was elected to the board of directors of that company at

(*Please turn to page 262*)

Now

It's Ready...



Packed with color illustrations and with detailed descriptive copy, this new first-of-its-kind catalog shows and describes the things you want to know when specifying business and accounting record forms and allied items.

Complete data on all of NATIONAL'S most popular lines: Business and Accounting Forms, Post and Ring Binders, Visible Records, Bound Books, Pads and Machine Bookkeeping Systems.

This comprehensive catalog of record-keeping supplies will help you know and help you get the forms you need to provide accurate records faster for any department or any phase of business.

See your National Stationer.

Or, clip a dollar bill to the coupon and we'll send your Catalog direct.

NATIONAL

NATIONAL BLANK BOOK COMPANY, DEPT. P
HOLYOKE, MASSACHUSETTS

Send my copy of *Business and Accounting Records* promptly. My dollar attached.

Name..... *Title*.....

Company.....

Street.....

City..... *State*.....

Want Additional Product Information? See Page 19.

JET WING

U.S.E.'s exciting new Air Mail border design

Stocked in 3 sizes — available for any other

UNITED STATES ENVELOPE CO.
Springfield 2, Mass.
13 MANUFACTURING DIVISIONS LOCATED FROM COAST TO COAST
See your Printer or Paper Merchant

THIN PAPERS
Reduce
TYPING, MAILING and FILING COSTS
Use
ESLEECK
THIN PAPERS

Fidelity Onion Skin
Clearcopy Onion Skin
Superior Manifold

Esleeck Manufacturing Co.
Turners Falls, Mass.

(*Continued from page 260*)

annual meeting of the stockholders, and the following were re-elected as directors: G. E. Williamson, C. M. Bryan, A. E. Shattuck, F. N. Bridgham, C. A. Russell, H. J. Rice, B. E. Stafford, R. F. Arnold, L. W. Shattuck, H. E. Riggs, and W. A. McGilpin. F. N. Bridgham was re-elected treasurer, P. A. Wilks and George Maxwell as assistant treasurers, and B. E. Stafford as clerk.

Following the annual meeting, the board of directors re-elected the following officers: G. E. Williamson, president and chairman of the board, and C. M. Bryan, A. E. Shattuck, F. N. Bridgham and H. E. Riggs as vice presidents.

It was reported that the company had experienced a good year, with the volume of business substantially the same as the previous year. However, because of higher costs of raw materials and labor, profits were not as large as the preceding year.

UNDERWOOD INTRODUCES NEW STANDARD TYPEWRITER

New standard typewriter finished in gray, known as the Rhythm Touch de Luxe model which features a full 10-inch writing line with standard width carriage is announced by the Underwood Corporation, 1 Park Ave., New York, N. Y.

Underwood's new Rhythm Touch and Rhythm Shift de Luxe typewriter.

The new machine has enclosed machine back and other refinements that make for quieter and easier operation. Other features include a deeper paper table, deeply threaded cylinder knobs, and larger variable line spacer knob. The self-locking visible front margin stops provide easy setting with positive accuracy. Tabulation is keyboard controlled for any one of more than 100 positions. Finger-form plastic key tops, concave and rimless make for finger ease, and dual touch tuning provides adjustment features to meet personal key tension requirements.

LOOKING FOR SOMETHING? PUT A "WANTED" AD IN CLASSIFIED SECTION SEE PAGE 360

SAFETY DRAWER CABINET

Production of cabinet containing 27 drawers, known as the Safety Drawer Cabinet, has been resumed by the Cole Steel Equipment Co., 285 Madison Avenue,

New York, N. Y. The inside dimensions of the drawers are 9″ wide, 3½″ high and 16″ deep. The outside dimensions of the cabinet, which has two doors equipped with a two-way locking device controlled by a paracentric lock, are 37½″ high, 30″ wide, and 18½″ deep. The cabinet is available in green or gray crinkle finish.

A NEW POSTAL SCALE

A new version of the Model 1546 mail scale, manufactured by the Hanson Scale Co., 525 N. Ada Street, Chicago, incorporates the new postal rates effective Jan. 1, 1949. It is a handy desk scale for quick, accurate weighing of letters and small parcels.

The new scale utilizes the same dependable spring mechanism but eliminates the scale case as the suspension unit. Instead, the mechanism is suspended directly on a steel channel that is wholly independent of the case. The case itself is now made of a heavy thermoplastic that is smoothly contoured and has a mottled gray finish. Light in weight—the entire scale weighs only 14 ounces—the case is so strongly molded that it will easily support a 200 lb. man.

Capacity of the scale is two pounds, measured in one-ounce graduations. The large, easy-to-read dial clearly shows postage rates for air and first-class mail, and for merchandise. Platform is 2″ x 3″ and is made of stainless steel. Height of the scale is 6½″, while the base measures 5½″ x 2¼″. Scales are individually packed and are shipped 12 to a carton.

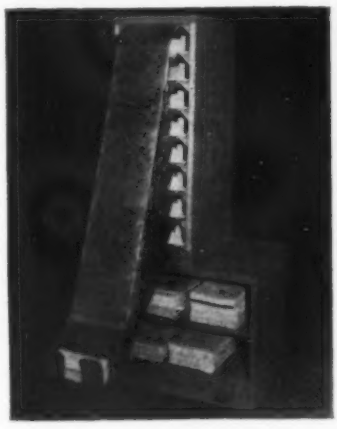
ST. REGIS BRINGS NEW KRAFT MILL INTO PRODUCTION

The St. Regis Paper Company announces the bringing into production of a new kraft paper mill at Tacoma, Wash. Part of the pulp manufactured at the company's sulphate pulp mill will now be converted into paper at Tacoma and then into multiwall paper bags in the company's western factories. During the past several years St. Regis has acquired

substantial timber resources in the Northwestern area. The new kraft mill at Tacoma is equipped with a Fourdrinier paper machine designed to produce multiwall kraft paper 168 inches wide at a rate of 2100 feet per minute. This represents a capacity to produce 240 tons of this type of paper every 24 hours.

EVANS GATHERING MACHINE

The accompanying picture is of the Evans Gathering Machine, made by the Evans Specialty Co., Inc., 407 N. Munford St., Richmond, Va. With one operator, the machine will gather up to 7000 sheets per hour, and maker states that sheets can be fed fast enough to keep two operators busy gathering 14,000 sheets



per hour. In operation, 500 sheets are placed on each of eight shelves, and through pressing foot pedal (or hand lever) the sheets slide down individual chutes to the bottom. Any size sheets from 3 x 5 to 12 x 17 inches can be assembled, and papers of different weights can be handled simultaneously. Possibility of doubles is said to be eliminated.

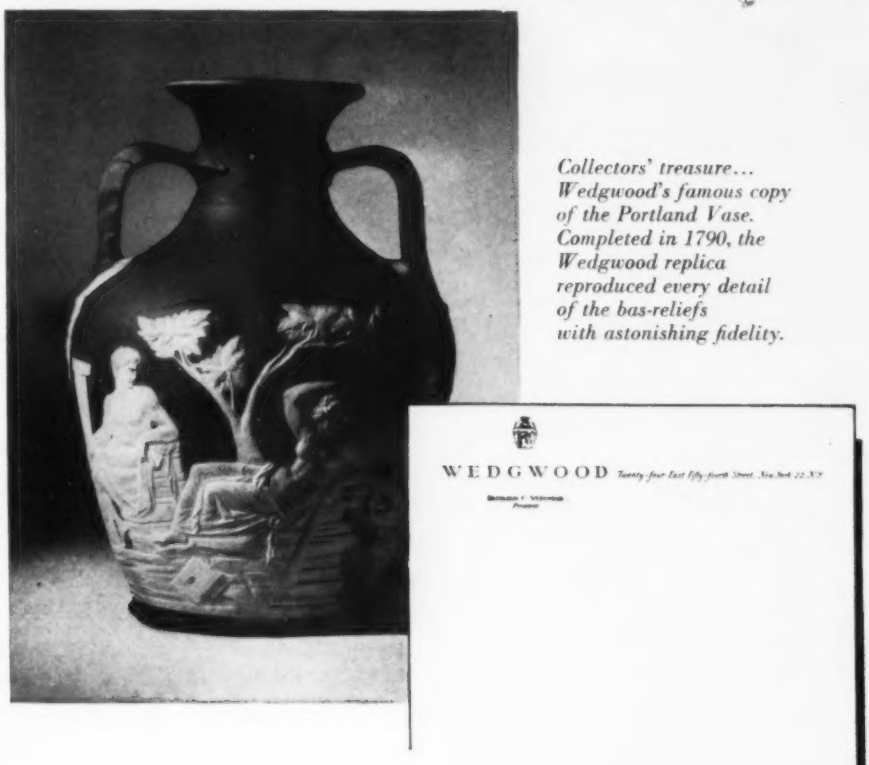
STRATHMORE INTRODUCES NEW LINE

Color is the big news in the new Chroma paper introduced by the Strathmore Paper Company. It presents a distinctive range of colors that offer richly expressive backgrounds that make it easy to produce outstanding printed pieces. Described as medium strong tones with unusual depth and softness, these colors make type and decoration speak out brilliantly from the paper.

Chroma can be readily and effectively printed by letterpress, offset lithography, diestamping and silk screen. The sheet size is a standard 26 x 40 with two weights—Basis 80 and Basis 80-2 sheet, making possible matching text and cover use. In addition to white and ivory, the colors are blue, green, mauve, gray, yellow, tan and rose. Matching envelopes are converted in all Substance 80 items.

Chroma is distributed by leading paper merchants from whom sample sheets of the paper, swatch sample books, and portfolios of printed pieces are available.

Prominent Users of Strathmore Letterhead Papers: No. 81 of a Series.



Collectors' treasure... Wedgwood's famous copy of the Portland Vase. Completed in 1790, the Wedgwood replica reproduced every detail of the bas-reliefs with astonishing fidelity.

Connoisseur of quality,

Wedgwood chooses STRATHMORE

For over three hundred years the name *Wedgwood* has been associated with the art of making pottery. Throughout the world Wedgwood Ware is prized for its beauty of design and magnificent craftsmanship. Obviously the Wedgwood letterhead must be unusually suggestive of quality and prestige. So, obviously, Wedgwood uses Strathmore for its letterhead.

If your current letterhead paper fails to do your firm justice, you will do well to have your letterhead supplier submit new designs on expressive Strathmore papers.

Strathmore Letterhead Papers: Strathmore Parchment, Strathmore Script, Thistlemark Bond, Alexandra Brilliant, Bay Path Bond, Strathmore Bond, Strathmore Writing.

STRATHMORE *MAKERS OF FINE PAPERS*

Strathmore Paper Company, West Springfield, Massachusetts

Among the ASSOCIATIONS

"Spotlight On The Future" Theme Of Public Utility Buyers' Group Meeting

"Spotlight On The Future" will be the general theme of the 1949 Conference of the Public Utility Buyers' Group of the National Association of Purchasing Agents, to be held this year at the Edgewater Beach Hotel, Chicago, on February 7 and 8. It will be the eighteenth annual meeting of the group.

The program for the conference, as announced by Chairman George H. Cole, Alabama Power Company, Birmingham, Ala., is as follows:

Monday, February 7, morning session on "Fundamentals", with R. W. T. Purchas, Supervisor of Purchasing, Middle West Service Company, Chicago, as chairman — Opening remarks, George H. Cole, chairman of the group; greetings, Wallace B. Burnet, President, Purchasing Agents Association of Chicago; introduction of N.A.P.A. president by Lyall C. Stilp, vice-president, District No. 3, N.A.P.A., Kimberly-Clark Corporation, Neenah, Wis.; "Our Professional Obligations", Ralph O. Keefer, President, National Association of Purchasing Agents, General Purchasing Agent, Aluminum Company of America, Pittsburgh, Pa.; "What An Operating Man Expects of the Purchasing Department", S. M. Dean, Chief Engineer of the System, Detroit Edison Company, Detroit, Mich.; "This Business of Purchasing", Stuart F. Heinritz, Editor, PURCHASING, New York, N. Y.

Afternoon Session On "Commodities"

Afternoon session on "Commodities", with H. E. Wilson, Purchasing Agent, Carolina Power & Light Company, Raleigh, N. C., as session chairman — Outlook: Production-Demand-Price on Pole Line Materials, T. H. Schaffer and M. M. Kenneally, Joslyn Manufacturing and Supply Company, Chicago, Ill., followed by discussion; Outlook: Production-Demand-Price on Electric Equipment, Tomlinson Fort, Manager Central Station Sales, Westinghouse Electric Corporation, Pittsburgh, Pa., followed by discussion. Outlook: Production-Demand-Price on Copper, Joseph W. Mullally, Manager of Utility Sales, Anaconda Wire and Cable Company, New York, N. Y., followed by discussion; Outlook: Production-Demand-Price on Steel, E. L. Shaner, Editor-in-Chief, "Steel," Cleveland, O.

The evening session will consist of cocktail hour in the west lounge, followed by dinner in the Marine Dining Room.

Tuesday, February 8, morning session on "Economics", with N. N. Ramsey, Purchasing Agent, Philadelphia Electric Company, Philadelphia, Pa. as chairman—"The National Defense Aspects of the Electric Power Program", Edward Falck, Chief Consultant on Power and Utilities, National Security Resources Board, Washington, D. C.; "Purchase Economies Through Standardization", W. C. Johnson, Executive Vice President, General Machinery Division, Allis-Chalmers Manufacturing Company, Milwaukee, Wis.; "Research and Development Work on Electric Utility Equipment", Ralph M. Darrin, Manager Central Station Divisions, General Electric Company, Schenectady, N. Y.; "From One P.A. to Another", George A. Renard, Executive Secretary-Treasurer, National Association of Purchasing Agents.

Afternoon session on "Education", with Ben R. Newbery, Director of Purchases and Materials, Lone Star Gas Company, Dallas, Tex., as chairman—"Purchasing Frontiers", George W. Aljian, Chairman, Education Committee, N.A.P.A., Director of Purchases and Packaging, California and Hawaiian Sugar Refining Corporation, San Francisco, Calif.; "The Utility Purchasing Agent — Administration", J. Donald Hogg, Secretary, Public Utility Buyers' Group, N.A.P.A., Purchasing Agent, Cleveland Electric Illuminating Company, Cleveland, O., followed by discussion; "Modern Trends in Stores Operation", Horace L. Brewer, Purchasing Agent, Consumers Power Company, Jackson, Mich., followed by discussion; Resolutions; Closing Remarks by the Chairman.

BUFFALO ASSOCIATION HAS ANNUAL EXECUTIVES' NIGHT

The annual Executives' Night meeting of the Purchasing Agents Association of Buffalo was held at the Hotel Statler on Wednesday, January 12.

Featured Speaker was William Moss of the Cling Surface Company, who spoke on "Life In Foreign Lands". Mr. Moss, who has been described as one of the most widely traveled men in the world, has been engaged exclusively in the export business all his life and is a recognized authority on foreign trade. He discussed interesting customs of life in the Orient, Latin America and Europe, including Russia. His talk included references to social, historical, economic and political aspects of the various countries described.

The February 9 meeting of the association will be devoted to commodities, under the direction of Earl Goodwin.

G. L. HASZARD NEW PRESIDENT OF BRITISH COLUMBIA ASSN.

G. L. Haszard, B.C. Electric Rly. Co. Ltd. has assumed the presidency of the Purchasing Agents Association of British Columbia, following the resignation of Alex Dunbar, who formerly held the post. Mr. Dunbar became ineligible for membership in the association in December, when he was made sales manager of his firm, The Vancouver Supply Co. Ltd.

W. M. Penny, City of Vancouver, has been appointed vice-president. A. J. Shaw, Bennett & White Construction Co. Ltd. has left his present employer to join Marwell Construction Co. Ltd. as estimator and has resigned as secretary of the association. No successor has yet been appointed.

The annual Christmas party on December 11, at which the purchasing agents were guests of the B.C. Products Bureau of the Vancouver Board of Trade, was a highly successful affair. Speakers were Alex Dunbar and Howard Mitchell, president of the Vancouver Board of Trade.

LOUISVILLE ASSN. HOST TO N.A.P.A. EXECUTIVE MEETING

The Purchasing Agents Association of Louisville played host to the Executive Committee of the N.A.P.A. which met in Louisville on January 27 and 28. The local officers held a dinner for the group at the Brown Hotel on Wednesday, January 26. On Thursday, January 27 the local association held its annnual Executive Night meeting, with N.A.P.A. President Ralph Keefer and Executive Secretary George Renard as featured speakers. The chairman in charge of the meeting, as well as for the Executive Committee meeting was Bill Kerrick, former Vice President for District Seven.

(*Please turn to page 266*)

Only GOULD Has It!

A modern research laboratory with pilot manufacturing plant where advance-design batteries are constantly created—and proved before production.

Gould uses the X-Ray Diffraction Unit for storage battery research. It measures distances between atoms—analyzing and aiding in the perfection of active materials.

The X-Ray Diffraction Unit actually measures the distances between atoms. It gives fast, accurate qualitative analyses of complicated metallic compounds, gives Gould complete control over the purity of active materials and is revealing new relationships between molecular activity and battery characteristics. That's why Gould batteries give predictable performance and longer life . . . why every Gould battery is packed with the most active power-producing material available today.

Specify GOULD—FOR FIFTY YEARS THE CHOICE OF ENGINEERS.

The Gould "Thirty"—America's Finest Industrial Truck Battery!

GOULD

STORAGE BATTERY CORPORATION

Including the Storage Battery Division of Philco Corporation

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

Toronto Christmas Party Draws 800

More than 800 purchasing agents and their ladies, from Toronto, Orillia, Oshawa and Peterboro, attended the annual Christmas party and ladies' night of the Purchasing Agents Association of Toronto, in Concert Hall, Royal York Hotel, Toronto, December 10.

The entertainment, following dinner, was under the direction of a lady M.C., Mary Smith Howard, and the show presented was entitled "Fun-N-Music". Each lady present was given a party favor by Santa Claus personally, and during the evening there were three drawings at which the winners were presented with a mantle radio.

Numbered among the special guests were His Worship Mayor H. E. McCallum of Toronto, and Mrs. McCallum. The committee in charge of arrangements for the evening was headed by Frank Smalley.

CAROLINAS-VIRGINIA ASSN. ELECTS C. H. DRY PRESIDENT

C. H. Dry of the Cannon Mills, Kannapolis, N. C., was elected president of the Carolinas-Virginia Purchasing Agents Association which concluded its 13th annual meeting at Pinehurst, N. C., on December 11.

Other new officers of the association are J. J. Preisinger, Carolina Aluminum Company, Badin, N. C., vice-president; and C. L. Wyrick, Dillard Paper Company, Greensboro, N. C., secretary-treasurer.

R. A. McCuiston of the Thomasville Chair Company, Thomasville, N. C. retiring president of the association, was presented with the Thomas Award for outstanding work for the association during the past year.

Over 150 guests attended the annual meeting, which featured as principal speakers Ralph O. Keefer, president of the National Association of Purchasing Agents, and J. S. Rutherford, Buffalo, N. Y., vice president of District 8.

ST. LOUIS ASSOCIATION HAS ANNUAL EXECUTIVE NIGHT

The Annual Executive Night meeting of the Purchasing Agents Association of St. Louis was held on Tuesday, January 11, at the Sheraton Hotel. Principal speaker was George A. Renard, executive secretary-treasurer of the National Association of Purchasing Agents, whose topic was "Purchasing's Responsibility In Management".

Brief comments on the subject "What's Ahead In Business In 1949" were made by the following top executives: John D. Eby, secretary and treasurer, Wagner Electric Corporation; J. W. McAfee, president, Union Electric Company of Missouri; Wm. A. McDonnell, president, First National Bank in St. Louis; and Howard I. Young, president, American Zinc, Lead & Smelting Co., and chairman of the board, St. Louis Chamber of Commerce.

"1949 BUSINESS OUTLOOK" CHATTANOOGA ASSN. TOPIC

The regular monthly meeting of the Purchasing Agents Association of Chattanooga was held on December 14 at the Hotel Patten. The meeting featured talks by representatives of four fields—banking, industry, labor, and economics—on the subject "The Outlook On Business in 1949".

Principal speakers were Roy W Meyers, vice president of the Hamilton National Bank; Stanton E. Smith, secretary and treasurer, Central Labor Union; P. H. Wood, president, Converse Steel and Bridge Company; and Dr. W. H. Wesson, professor of economics, University of Chattanooga. General agreement was reached that 1949 would see relatively high production, income and employment, major price revisions downward in some lines, and a 15 per cent drop in construction costs.

The association has suffered a loss of two of its most active and hard working members. J. Frank Kelly, former Association president and District 7 vice-president, and Charles H. Burke, who was secretary of the association, passed away recently.

Plans for the annual industrial show in Memorial Auditorium have been completed, and the affair is scheduled for the first week in March. Ralph Rogers will manage the show. Outstanding exhibits of the latest industrial items will be presented at the show, which is expected to be one of the finest of its type ever held in the Southeast.

POWER EXPERT SPEAKER AT OREGON ASSOCIATION MEETING

Speaking at the December 7 meeting of the Purchasing Agents Association of Oregon, Fred Arpke, Bonneville Power Administration economist told the group that pig aluminum production in the Pacific Northwest now stands at about 50 per cent of the total national output, reflecting one phase of the area's industrial expansion which can be credited to the Columbia River hydro-electric development.

He warned that the current power bottleneck must be overcome if the region is to continue to attract new industries, and predicted that future industrial growth would probably lean heavily toward processing and light fabricating types of plants.

"FOLLOW-UP FUNCTION" TOPIC AT CENTRAL IOWA MEETING

The Purchasing Agents Association of Central Iowa held its regular monthly meeting on Tuesday, January 4, at the Savery Hotel.

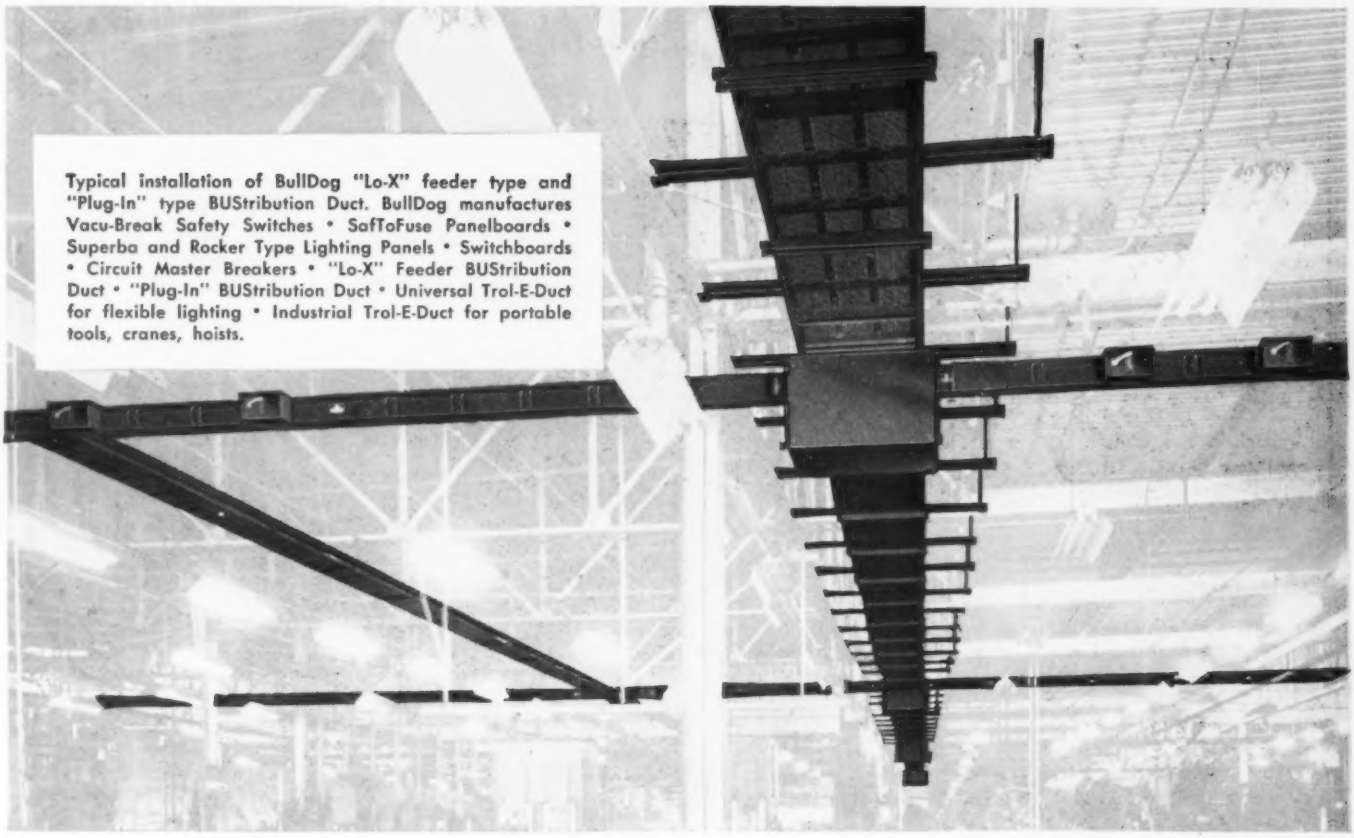
Following dinner, Lynden E. Hoffman, Dean of the College of Commerce and Finance, Drake University, acted as moderator for a round table discussion of "The Follow-Up Function". Irving Conn, Purchasing Agent of the Parsons Company, Newton; and E. R. Michel, Purchasing Agent of the Green Colonial Furnace Company, Des Moines, directed questions on the subject. This was the first forum discussion on purchasing problems since the organization of the association.

DAYTON ASSOCIATION HOLDS ANNUAL LADIES' DANCE

The annual ladies' mid-winter party and dance of the Purchasing Agents Association of Dayton was held on Saturday evening, January 29 at the Miami Valley Golf Club. One of the features of the affair was a program of music and songs by a group of entertainment stars from radio station WLW in Cincinnati.

Featured speaker at the December dinner meeting of the association was A. L. Freedlander, president of Dayton Rubber Company. Mr. Freedlander outlined the history of the development of synthetic

(*Please turn to page 270*)



Typical installation of BullDog "Lo-X" feeder type and "Plug-In" type BUStribution Duct. BullDog manufactures Vacu-Break Safety Switches • SafToFuse Panelboards • Superba and Rocker Type Lighting Panels • Switchboards • Circuit Master Breakers • "Lo-X" Feeder BUStribution Duct • "Plug-In" BUStribution Duct • Universal Trol-E-Duct for flexible lighting • Industrial Trol-E-Duct for portable tools, cranes, hoists.

Power with a foolproof future

CAN you foresee the many changes which may come to your plant in the next five or ten years?

Naturally not! But when it comes to electrical power distribution, BullDog BUStribution systems offer flexibility to meet any change the future holds.

Take machine layout changes: With BullDog "Plug-In" BUStribution Duct, moving machinery is like moving household appliances—simply unplug machine from duct, move, and plug in at new location.

If necessary, your entire BUStribution system can be easily and quickly dismantled, moved, and set up . . . without scrapping a nut or bolt—it's flexible and salvable.

BullDog "Lo-X" BUStribution Duct, for secondary feeders, is prefabricated to exact performance standards. Ventilated construction and paired-phase arrangement of silvered-copper bus bars reduces temperature rise, assures high current-carrying capacity and reduces reactive voltage drop. BUStribution Duct is sturdily built for years of finest service.

Your local BullDog Field Engineer will be glad to show you a BullDog BUStribution system in your own neighborhood. Let him look over your requirements and answer your questions.

BullDog Field Engineers welcome the opportunity to sit in with you during the early planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation costs, as well as efficiency and reliability in actual operation. Why not take advantage of this service?

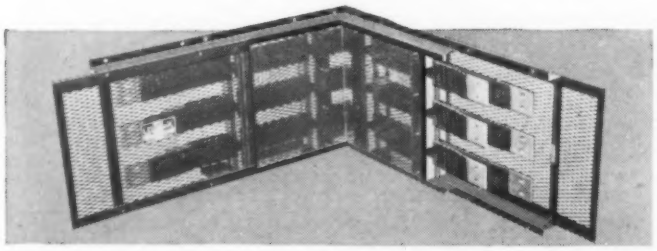
BULLDOG ELECTRIC PRODUCTS COMPANY

DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES

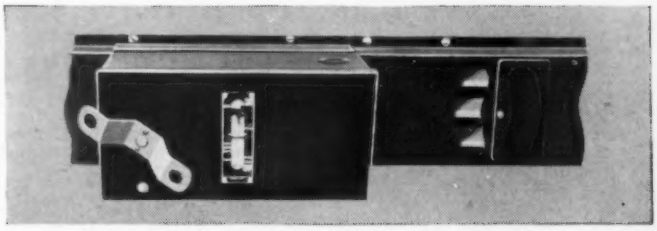
IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

BULLDOG

HEADQUARTERS FOR ELECTRICAL DISTRIBUTION

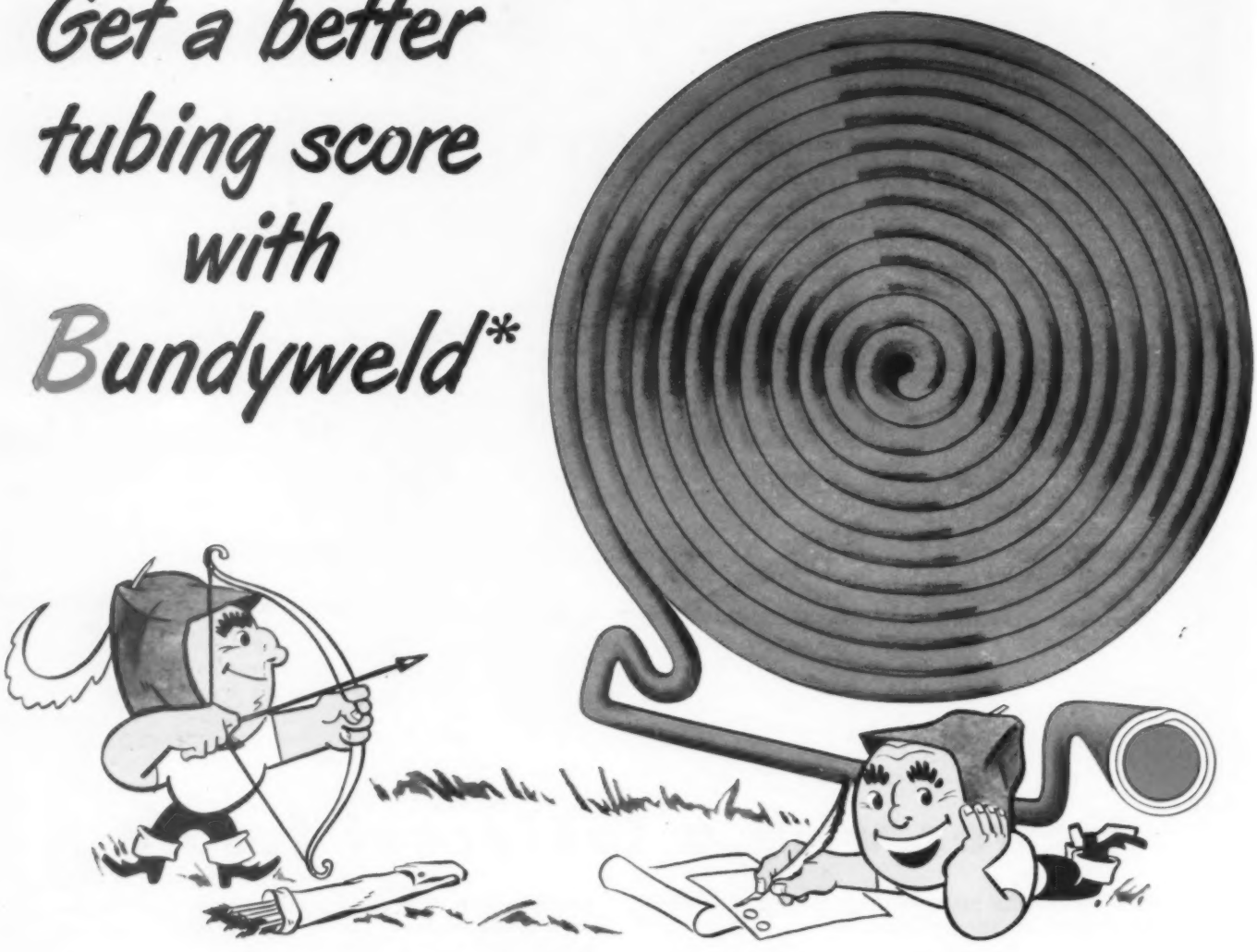


Section of "Lo-X" BUStribution Feeder Duct, used for main secondary power feed. "Lo-X" Duct is prefabricated in ten-foot lengths, in capacities from 600 Amps. to 4000 Amps., 600 Volts or less. Close spacing and paired-phase arrangement of bus bars reduces reactive voltage drop



Section of "Plug-In" Duct, showing Vacu-Break Bus Plug for tap-off purposes. Crescent-shaped openings make it impossible to insert plugs incorrectly. Each ten-foot section of "Plug-In" Duct has ten such openings. Capacities: 200 Amps. to 1350 Amps., 600 Volts or less.

Get a better tubing score with Bundyweld*



Get a better score on *1*) production costs, *2*) quality, and *3*) time and labor savings by checking Bundyweld Tubing.

Bundyweld *and only Bundyweld* is double-walled from a single strip of metal. Copper-brazed at all points of wall contact, thin, extra-strong Bundyweld assures less leakage under pressure, less breakage under short-radius bends. It is readily fabricated, lightweight, and easy to handle.

Here are only a few of the industries which have made Bundyweld the standard for many of their tubing applications:

Automotive—fuel, hydraulic, vacuum, and brake lines.
Refrigeration—condenser, evaporator, and compressor tubing parts.
Range—supply lines, flash and pilot tubes.
Radiant heating—panel grid tubing.

Bundyweld for television antennas; beer coils of special Bundyweld Nickel; toy baby carriages, whistling gas-tank signals—these are just a few of the applications of Bundy Tubing that are making profits for their manufacturers.

If you have a design or production problem, or a new idea for tubing, why not contact Bundy engineers to help you work it out? Just call or write: *Bundy Tubing Company, Detroit 14, Michigan.*

BUNDY TUBING

ENGINEERED TO YOUR EXPECTATIONS

® REG. U.S. PAT. OFF.

WHY BUNDYWELD IS BETTER TUBING

1 Bundyweld Tubing, made by a patented process, is entirely different from any other tubing. It starts as a single strip of basic metal, coated with a bonding metal.

2 This strip is continuously rolled twice laterally into tubular form. Walls of uniform thickness and concentricity are assured by close-tolerance, cold-rolled strip.

3 Next, a heating process fuses bonding metal to basic metal. Cooled, the double walls have become a strong ductile tube, free from scale, held to close dimensions.

4 Bundyweld comes in standard sizes, up to 5/8" O.D., in steel (copper or tin coated), Monel or nickel. For tubing of other sizes or metals, call or write Bundy.

BUNDY TUBING DISTRIBUTORS AND REPRESENTATIVES

Cambridge 42, Mass.: Austin-Hastings Co., Inc., 226 Binney St. • ***Chattanooga 2, Tenn.:*** Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. ***Chicago 32, Ill.:*** Lapham-Hickey Co., 3333 W. 47th Place • ***Elizabeth, New Jersey:*** A. B. Murray Co., Inc., Post Office Box 476 • ***Philadelphia 3, Penn.:*** Rutan & Co., 404 Architects Bldg. • ***San Francisco 10, Calif.:*** Pacific Metals Co., Ltd., 3100 19th St. • ***Seattle 4, Wash.:*** Eagle Metals Co., 3628 E. Marginal Way • ***Toronto 5, Ontario, Canada:*** Alloy Metal Sales, Ltd., 881 Bay St.

BUNDYWELD NICKEL AND MONEL TUBING IS SOLD BY INTERNATIONAL NICKEL COMPANY DISTRIBUTORS IN PRINCIPAL CITIES.

HOW TO SAVE UP TO 80% ON PAINTBRUSH COSTS

Brushes bristled with Du Pont nylon lead way to substantial savings in industrial maintenance

Take four-fifths of whatever amount your firm has spent in the past year for paintbrushes with ordinary bristles. The result will be a fair estimate of how much your firm can *save* in a year with *nylon*-bristled paintbrushes.

Such savings are possible because nylon bristles outlast others up to five times, while returning equally good service. Properly made, nylon-bristled paintbrushes make excellent painting tools for work on both rough and smooth surfaces. They are extremely resistant to wear, paint vehicles and solvents. Factory after factory across the country is using brushes bristled with nylon for savings in maintenance painting.

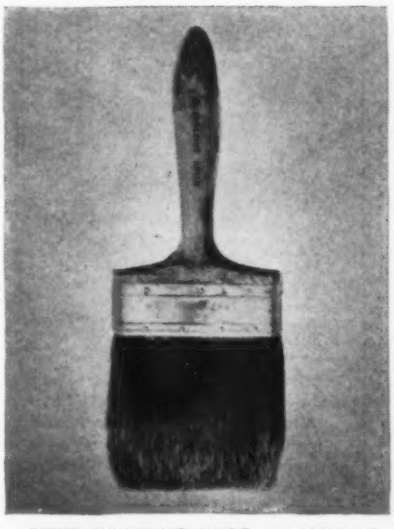
But remember . . . make sure you get genuine nylon. If the word "nylon" is not stamped plainly on the handle, the brush is not made with nylon!

FREE BOOKLET GIVES THE FACTS

It will pay you to look into nylon-bristled paintbrushes for your firm NOW. They're made by leading paintbrush manufacturers. If your brush supplier cannot meet your needs, just write us. Meanwhile, clip the coupon for copies of our 16-page illustrated booklet, "How You Can Save Money on the Job with Paintbrushes Bristled with Du Pont NYLON," for distribution to painters employed by your firm. This booklet is filled with facts on the use, care and economy of nylon-bristled paintbrushes.

AFTER 5 MONTHS' SERVICE for a prominent railroad on all types of paint jobs, this nylon-bristled brush looks almost as good as new.

WORKED 6 DAYS A WEEK for 8 months by a Cleveland paint company, this nylon-bristled brush still had most of its life to live.



AFTER PAINTING 3500 to 4000 oil drums for a New York City oil company, this nylon-bristled brush shows it's still in excellent condition.

USED ON CONCRETE, stone and wood for 8 months by a midwest transportation company, this nylon-bristled brush shows very little wear.

DU PONT
NYLON BRISTLES

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

CLIP COUPON AND MAIL TODAY!

E. I. du Pont de Nemours & Co. (Inc.)
Plastics Department, Room 842, Arlington, New Jersey

Please send ( ) copies of your illustrated book, "How You Can Save Money on the Job with Paintbrushes Bristled with Du Pont NYLON."

*Name*_____

*Firm*_____

*Address*_____

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Hand Gauging of large diameter Strom Balls before packaging

When you specify Strom Balls you are sure of getting balls with the highest obtainable degree of finish, sphericity, precision—balls that give the very highest quality of service in any bearing equipment. This high degree of perfection is the result of Strom's concentration for a quarter of a century on metal balls exclusively and the perfection of the processes and workmanship necessary to produce them. Strom Steel Ball Company, 1850 South 54th Avenue, Cicero 50, Illinois.

Strom BALLS Serve Industry

LARGEST INDEPENDENT AND EXCLUSIVE METAL BALL MANUFACTURER

Quality

CLARK BROS BOLT CO.

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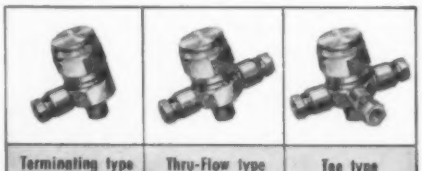
BOLTS NUTS SCREWS and RIVETS

The Titeflex GRANNAN LUBRICATOR

for dependable, single line *Centralized Lubrication*

Install *one* TITEFLEX Grannan Lubricator on each bearing in your machine or mechanism, connect up with *one* central line (tubing or pipe), and all you need do is introduce the oil or grease at *one* central point to assure perfectly metered lubrication of each bearing. The savings in time are amazing. Write for free, descriptive booklet—today.



Terminating type | Thru-Flow type | Tee type

Titeflex, Inc.

533 Frelinghuysen Ave., Newark 5, N. J.

Exclusive Manufacturers of Titeflex high quality products for more than 30 years

Sales Offices: CHICAGO CLEVELAND DETROIT PHILADELPHIA LOS ANGELES BOSTON SAN FRANCISCO TORONTO

(*Continued from page 266*)

rubber, with particular emphasis on the phenomenal discovery of low temperature "cold" rubber.

New members of the association include Charles E. Duncan, Miami Valley Hospital, Dayton; Miss Thora M. Waltemath, International Clay Machinery Co., Dayton; A. G. Ruediger, Airtemp Division, Chrysler Corp., Dayton; H. W. Howard, Crown Controls Co., Inc., New Bremen, O.; Don F. Kelker, Duriron Co., Inc., Dayton; and Maxwell W. Smith, Duriron Co., Inc.

Member Robert F. Blank has been elected president of the Exchange Club of Dayton. Joe S. Thomas has taken the place of Newman C. Ebersole on the N.A.P.A. Fuels Committee. Member Lee Brower has been appointed to the committee to study problems created by the recent Supreme Court decision on basing points as it relates to steel and other bulk commodities.

ROCHESTER BUYERS HEAR TALK ON PLASTICS

A regular meeting of the Rochester Association of Industrial Buyers was held on January 12 at the Normandie Hotel.

Speaker of the evening was G. V. Delaire of the Camera Works Plastics Laboratory. His talk briefly covered the elementary principles of molding and forming plastics, and included a discussion of the newer developments in plastics.

Featured at the annual Christmas party of the group on December 8 was a colored motion picture showing the fitting up of a sailing vessel and her voyage across the Atlantic, narrated by Bill Ewell of the Rochester Lead Works, who served as one of the crew and shot the pictures.

WASHINGTON, D. C. WOMEN CELEBRATE CHRISTMAS

The Purchasing Agents Association of Washington, D. C.—Women's Division, celebrated the Christmas season by making its December meeting a social gathering for members and friends. The party was held on the evening of December 17 in the club rooms of the Kappa Gamma Sorority.

TOLEDO ASSN. HEARS TALK ON "WHY I AM AN AMERICAN"

The regular meeting of the Purchasing Agents Association of Toledo was held at the Toledo Yacht Club on Tuesday, January 11. Featured speaker was George Biro, of the Biro Manufacturing Company, Marblehead, O., whose subject was "Why I Am An American". Included in his talk were observations made on a recent trip to his native Czechoslovakia.

Two moving pictures, "Mrs. America Speaks", and "That The World May See" were shown through the courtesy of Owens-Illinois Glass Co. They presented a picture of "consumer purchasing".

(*Please turn to page 274*)

ASK STOKES

70% Labor Saving with Automatic Molding

SAVINGS of 70% in labor costs were made by a custom molder when he used a Stokes completely automatic plastics molding press.

Previously he had used a conventional semi-automatic press with preformer and preheater. He produced the souvenir ash tray (illustrated) on a two-cavity mold at a total labor cost of $17.00 per thousand finished pieces.

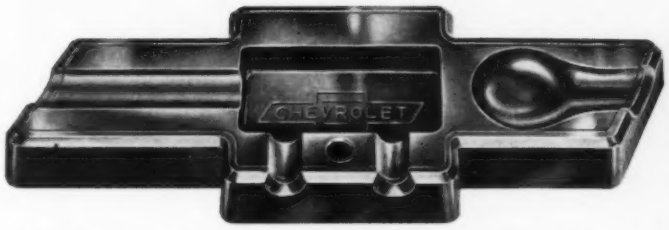
Now, using a Stokes automatic 50-ton press, with a single cavity mold, he produces the same ash tray for a labor cost of $5.10 per thousand pieces . . . a saving of $11.90 per thousand for labor alone. These are his figures, *not ours.*

And further major savings resulted from using the high-production single-cavity mold, instead of the former higher-cost multi-cavity mold.

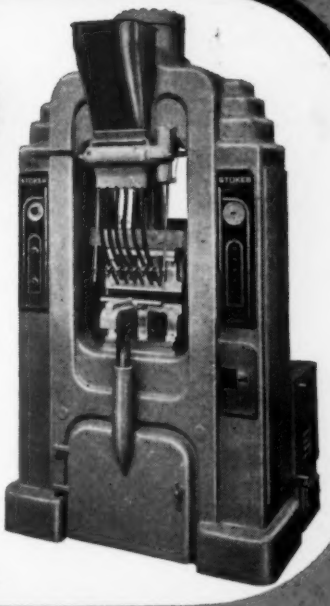
If you want to know what automatic molding can save you, send your own samples or blueprints to Stokes for free analysis.

F. J. Stokes Machine Company,
5902 Tabor Rd., Phila. 20, Pa.

Stokes makes Semi-Automatic and Automatic Molding Presses, Plunger Presses, Closure Presses, Preforming Presses, Industrial Tabletting and Powder Metal Presses, Vacuum and Special Processing equipment, Water Stills and Special Machinery.



This souvenir ash tray was produced at a 70% saving in labor cost on a Stokes Automatic Molding Press, similar to Model 235A, illustrated here.



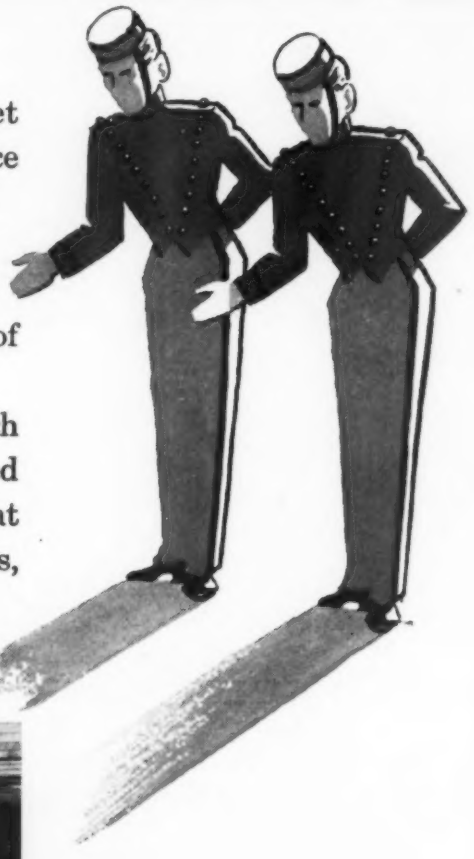
Condensed Press Specifications, Model 235A

Maximum Press Capacity (Tons) . . .	50
Maximum Stroke (Inches)	14
Upper and Lower Platens (Inches) .	14 x 7
Feeding Device – Chambers	6
Capacity per feeding chamber, (Cu. In.)	⅛ min. - 4 max.

STOKES KNOWS HOW

Want Additional Product Information? See Page 19.

HE IS DOUBLY SERVED
WHO GETS HIS STEEL, and
GETS IT... when he wants it



International has helped many manufacturers meet their supply problems by providing dependable service in de-coiling, flattening, cutting, and pickling, or by coil slitting.

Here you will find such equipment as is used by the mills . . . the most modern, independent setup of this kind in the Midwest.

International — like everyone — has none too much steel. But, if you have available tonnages of hot rolled coil, International can process it for you on a basis that will assure a dependable, steady supply . . . and, perhaps, save you money. Ask about our service.

International's Flying Shear de-coils, flattens, cuts accurately to length. Coil slitter may be seen in background.

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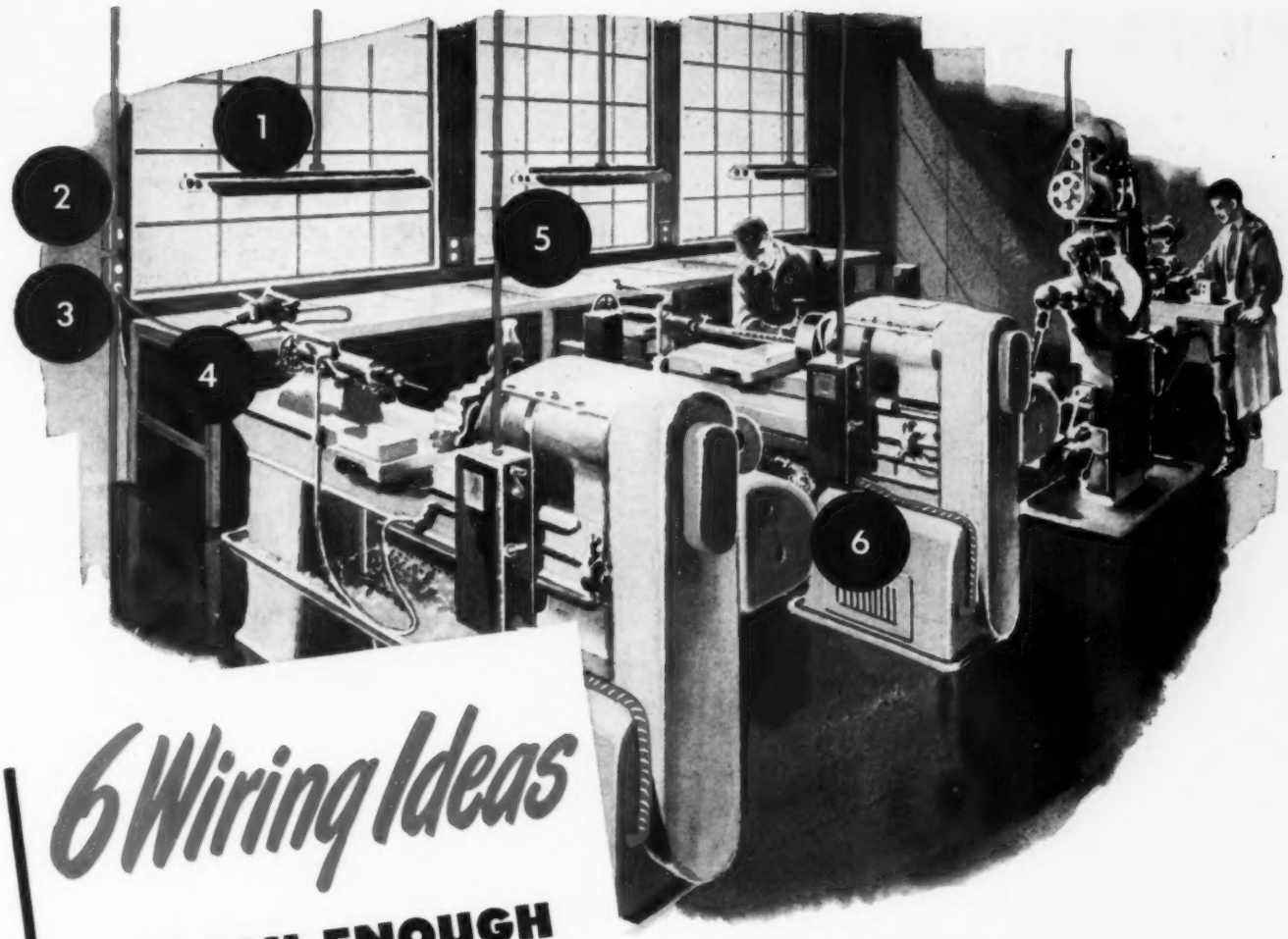


6 Wiring Ideas

TOUGH ENOUGH FOR TOOLROOMS

Cutting costs is the toolroom's job. And all wiring material in a toolroom has got to be tough enough to work economies every step of the way.

That's why we've picked six cost-cutting General Electric wiring materials right off your distributor's shelves to help you get full value out of every dollar.

1. **HEAT-RESISTANT** Deltabeston* wires go a long way toward reducing maintenance. Made for locations like this, where ambient heat and high-level lighting circuits are a problem, Deltabeston wires are a "must" for every shop. Consider Deltabeston wires and cables for all circuits where heat is a threat, and wherever high current densities are involved.

2. **HEAVY-DUTY SWITCHES** selected from the complete General Electric line have the toughness it takes to stand up in a toolroom. They're totally enclosed to keep out flying chips and dust—built to take a beating day after day. Choose the switch for the job you want to do from General Electric's wide range of 20- and 30-ampere types.

*Trade-mark Reg. U. S. Pat. Off.

3. **HEAVY-DUTY OUTLETS** have got to be tough, too, to take the abuse of a toolroom. Three-wire outlets from the General Electric line are available in types to meet the most difficult specifications. Sturdy construction and tough materials are used throughout in these heavy-duty units.

4. **PORTABLE CORDS**—General Electric Flamenol* portable cords are proving that they can take it every day on jobs like this. Thermoplastic jacket has the flexibility and strength needed for tools that are constantly in use. These cords take hard knocks and abrasion in their stride—resist acids, alkalies, water, and oil. Use Flamenol portable cords for reduced maintenance on medium- or heavy-duty tools.

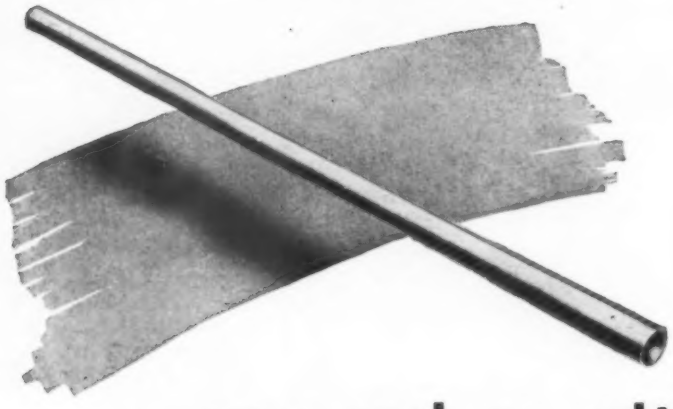
5. **BUS DROP CABLE** is another tough item from General Electric's line of wires and cables—designed to take a beating in a difficult spot. Neoprene jacket takes plenty of abuse—flexes easily for installation in problem locations—stays in for a long, long time.

6. **FLEXIBLE CONDUIT** is the protection you need on motors and motor-driven tools. Wherever there's vibration or movement, use General Electric flexible conduit. Its strip-wound construction lets it move with the tool—steel gives it the strength wiring needs for protection.

These are just a few of the tough, long-life items in the complete General Electric wiring materials line. Your distributor can supply you with these or any of the other materials you need to do your job well. Ask him about them, or write for information to Section K15-270, Construction Materials Department, General Electric Company, Bridgeport 2, Connecticut.

GENERAL ELECTRIC

When you START with TUBING



you end up with LOWER COSTS

★ You pay only for a minimum of metal

★ You get desired strength with less weight

★ You have two usable surfaces—outside and inside

★ Fabrication is often simplified

Superior cold drawn metal tubing in sizes up to ⅜" OD is constantly being used to advantage—and in many applications to replace solid stock. Products as diversified as wrist watch bands, soda dispensers, machinery parts, and wiring connectors are benefiting by Superior's ability to produce tubing in Carbon and Stainless Steels, Nickel and Nickel Alloys, Beryllium Copper and other special alloys—to exacting specifications at costs that are helpful to you.

Why not take stock of your material specifications? When you replace with Superior tubing you have everything to gain.

Superior

THE BIG NAME IN SMALL TUBING (.010" TO ⅜" O.D. MAX.)

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For Superior Tubing on the West Coast, call PACIFIC TUBE CO., 5710 Smithway St., Los Angeles 22, Cal. • ANgeles 2-2151

WASHINGTON MEETING FEATURES FILMS

A regular meeting of the Purchasing Agents Association of Washington, D. C. was held on December 14 in the Burlington Hotel, with President K. M. Pardoe presiding.

The program featured two interesting films on diverse subjects. The first was "Crystal Clear", a picture on crystals manufactured for use in connection with telephone equipment, which was furnished through the courtesy of the Bell System. Also shown was a 30-minute color film "Air Power is Peace Power", featuring Capt. Eddie Rickenbacker. The picture was a review of flight from the Wright Brothers to rockets, and was shown through the courtesy of the film division of Eastern Air Lines.

J. S. Rutherford, vice-president of N. A. P. A. for District 8, was a guest at the meeting, and his brief remarks were enjoyed by all.

NEW ENGLAND ASSOCIATION HEARS UTILITY EXECUTIVE

Robert E. Shillady, Vice President and General Purchasing Agent of the New England Power Service Co., Boston, Mass., was guest speaker at the January 10 meeting of the New England Purchasing Agents Association. The meeting was held in the Hotel Vendome, Boston.

Mr. Shillady's subject was "Purchasing For A Large Utility System".

The afternoon conference featured a talk by Charles J. Hudson, Quality Control Manager of the Abrasives Division of the Norton Company on "Factors Which Control Quality and Service in the Abrasive Industry. In connection with his talk, a moving picture, "New Single Crystal Abrasive", was shown.

EASTERN INDIANA ASSN.

A regular meeting of the Purchasing Agents Association of Eastern Indiana was held at the Delaware Country Club, Muncie, Ind., on December 9. A short talk was given by William Baldwin, Shell Oil Company representative of Fort Wayne. A satire on buyer-seller relationship was also presented.

SPRINGFIELD ASSOCIATION HOLDS COMMODITY DISCUSSION

The regular monthly meeting of the Springfield Purchasing Agents Association was held at the Shawnee on Wednesday evening, December 8. The program of the evening featured a commodity discussion led by Frank Brady of the Robbins & Meyers Company.

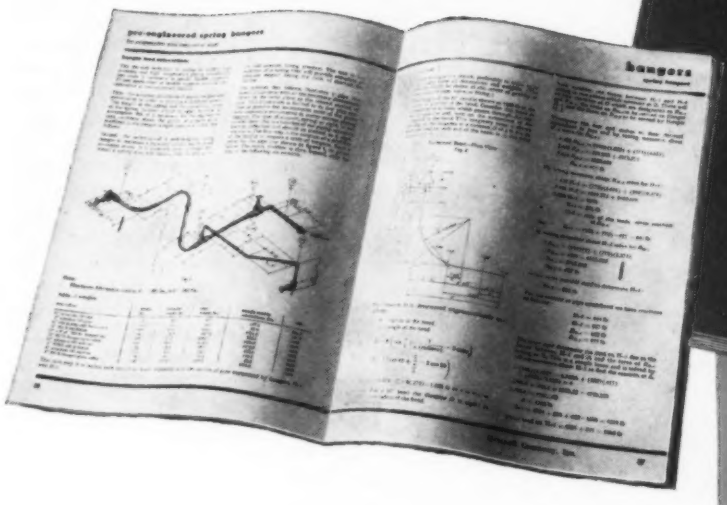
Association members brought to the meeting approximately 200 neckties, to be dry cleaned and turned over to the boys of the Clark County Home for Christmas. On December 22, the association entertained a large group of boys and girls from the home at a Christmas party.

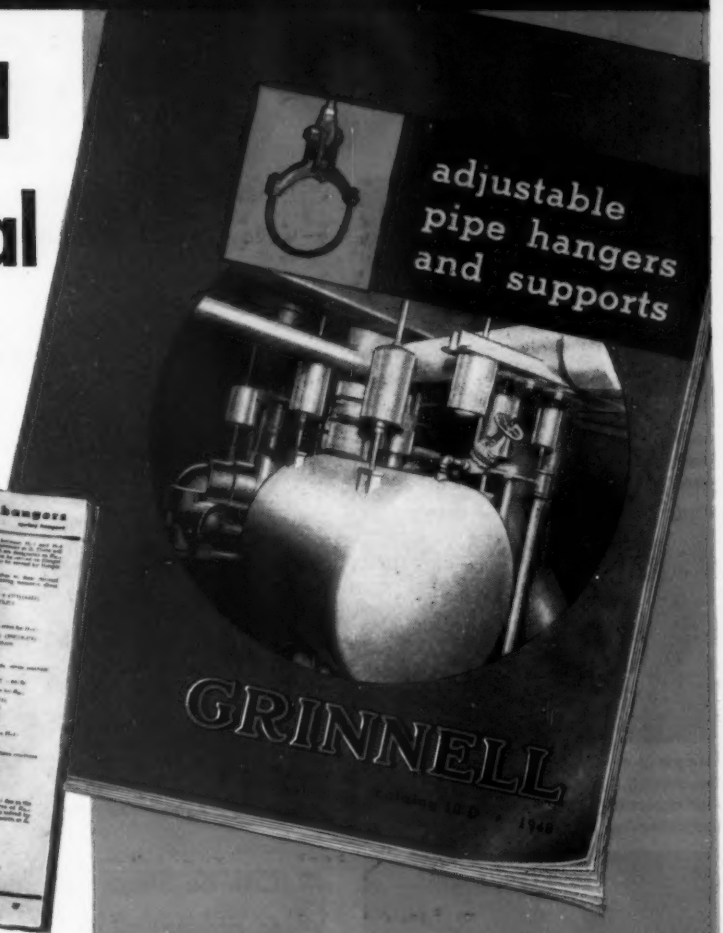
(*Please turn to page 276*)

You'd pay real money for this book!

The NEW Grinnell Pipe Hanger Manual

. . . and comprehensive catalog 10-D





FIRST TIME . . . in one 92-page book every pipe hanger, part and accessory, with full instructions for easy selection and correct specification.

Grinnell engineers worked for months to put into one orderly, completely illustrated book everything you need to write hanger specifications precisely. It's a complete catalog of Grinnell Pipe Hangers and Supports and a comprehensive manual . . . all in one. It's worth money to you but it doesn't cost you a penny. Write for your copy today. Grinnell Company, Inc., Providence 1, R. I.

- ★ Maximum recommended load rating for each hanger at various temperatures with minimum safety factor of 5
- ★ How to make load calculations for spring hangers, step by step, with drawings
- ★ Constant support or variable spring hangers may be selected and specified from simple load tables
- ★ Method of calculating take-out and determining hanger rod lengths . . . schematic drawings and formulas
- ★ Standard specifications with tables of maximum spacing between pipe supports, load carrying capacity of steel hanger rod, also rod size as determined by pipe size for fire protection work
- ★ A complete line of cast and malleable hangers ranging from the simplest plumbing or heating installation to the most complicated power plant installation

99 YEARS
WHENEVER PIPING IS INVOLVED

GRINNELL

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SAVE THESE 8 WAYS WITH LAMINUM* SHIMS!

LAMINUM shims are laminated shim brass or steel built into a "solid", unit structure by an exclusive process.

Simply p-e-e-l for your adjustments. No machining, filing or grinding required for accurate factory assembly or service adjustments.

The remaining "solid" shim is always uniform in gauge, with a hard surface . . . clean and smooth as glass.

1 Assembly time reduced up to 30%. No precision machining, grinding, filing, miking.

2 All adjustments made at the job by peeling laminations. No standby lathe.

3 No fumbling and counting loose, paper-thin wafers.

4 Less compressible than ordinary one-piece or stacked shims.

5 Cut to your exact specifications. Less than 1% rejects over the years.

6 Can be fitted with babbitted lugs to prevent oil and pressure loss.

7 No new skill required for use.

8 Your customer recognizes the plus value of less "down time" for maintenance and adjustment.

Send today for chart illustrating 46 money-saving, time-saving applications, detailed specifications, sample of LAMINUM.

PRECISION STAMPINGS in any quantity

Let us quote on your *difficult* stamping jobs. Our experience, tools and presses are geared for *close tolerance* production.

* LAMINUM (Reg. U. S. Pat. Off.) shims are solidly bonded laminations of .002 or .003 inch precision gauge brass or steel with a microscopic layer of metallic binder. Cut to your exact specifications.

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THE SOLID SHIM THAT peels FOR ADJUSTMENT

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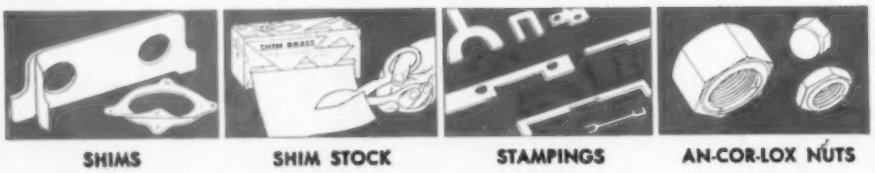
2402 Union Street Glenbrook, Conn.



SHIMS SHIM STOCK STAMPINGS AN-COR-LOX NUTS

N. W. PENNA. ASSN. HEARS PUBLIC RELATIONS CONSULTANT

A regular meeting of the Purchasing Agents Association of Northwestern Pennsylvania was held on Thursday, January 13, at the Carver House, Warren, Pa. The principal address was made by Julius King, public relations consultant of Jamestown, N. Y., who spoke on "Public Relations As It Affects Purchasing". A commodity discussion on steel, conducted by H. W. Ledebur, followed the talk.

JUNIOR MEMBERS CONDUCT WASHINGTON ASSN. MEETING

The regular monthly meeting of the Purchasing Agents Association of Washington was held at the New Washington Hotel, Seattle, on Thursday, January 13.

The entire evening's program was arranged and conducted by the junior members of the association, headed by William M. Fischer, chairman, of Colby Steel & Engraving Co. Features of the program were movies of the recent world series, shown through the courtesy of the Seattle "Post-Intelligencer" and a discussion on baseball prospects for 1949 by Jo Jo White, manager and R. C. Torrance, vice-president of Seattle Rainier's baseball club. Business survey reports in the retail, wholesale, and heavy industry fields were given by Doyl Hoyt, American Mail Line; Jack Miner, Yukon Equipment Co.; and William T. Glen, Isaacson Iron Works.

OIL FILM SHOWN AT SOUTH BEND MEETING

The regular meeting of the Purchasing Agents Association of South Bend was held at Alby's Steak House on Wednesday, January 12. A technicolor movie, "Prospecting for Petroleum" was shown, followed by a commodity report on "Copper, Bronze and Brass", by L. J. Munzenmaier of C. G. Conn, Ltd., of Elkhart.

CHARTER MEMBER NIGHT AT CHATTANOOGA ASSN.

The regular monthly meeting of the Purchasing Agents Association of Chattanooga was held Tuesday evening, January 11 at the Patten Hotel.

The meeting was designated "Charter Membership Night", and honored the charter members of the association. Six of the surviving charter members attended. P. J. Mullery was unable to attend because of illness.

Principal speaker was Tom Harris, Director of Purchases, E. I. Du Pont Company of Wilmington, Del., who, with George Renard, visited Chattanooga in June, 1930 and helped organize the local chapter.

(*Please turn to page* 278)

A N N O U N C I N G

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NEW

IMPROVED SOL-SPEEDI-DRI

OUT OUR WAY

THAT NEW SOL-SPEEDI-DRI SURE SEEMS LIGHTER AND FLUFFIER!
YEP, AND THE NEW SOL-SPEEDI-DRI COSTS LESS TO USE BECAUSE IT COVERS MORE AND ABSORBS MORE!
TAKES A BIGGER BAG NOW FOR SOL-SPEEDI-DRI 'CAUSE THERE'S MORE TO EVERY POUND!
THE PEOPLE WHO PRODUCE SOL-SPEEDI-DRI AIN'T ASLEEP! THEY MAKE SOL-SPEEDI-DRI BETTER AND BETTER ALL THE TIME
BIGGER AND BETTER
J.R.WILLIAMS
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NEW SOL-SPEEDI-DRI
Gives You *More Volume* Per Pound

NEW SOL-SPEEDI-DRI
Covers More Floor Area Per Pound

NEW SOL-SPEEDI-DRI
Absorbs More Liquids Per Pound

WRITE FOR THE FACTS!

Yes, Sol-Speedi-Dri — the new, improved Sol-Speedi-Dri — is here! And it is more economical to use than ever before, because you get more bulk, more coverage, more absorption, per pound.

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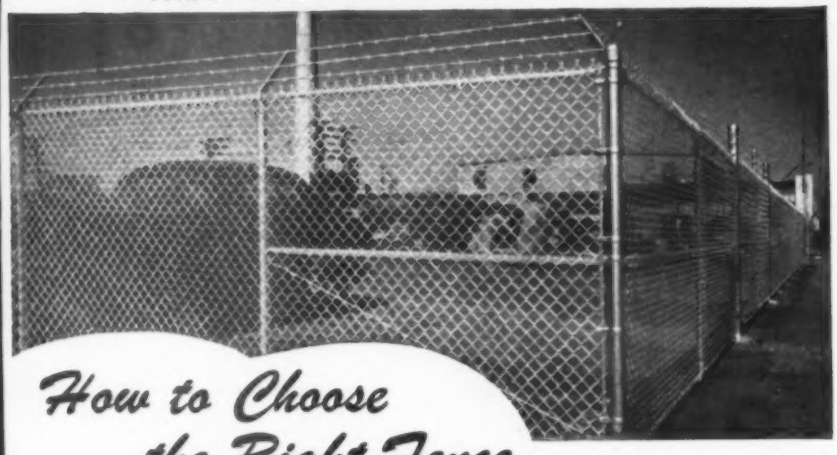

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Magnus Hand Cleaner

- Fast . . . Thorough . . . Comfortable
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FOR HAND CLEANING IT'S

Magnus

CLEANERS • EQUIPMENT • METHODS

FILM ON MODERN FILING SHOWN TO WASHINGTON ASSN.

The regular meeting of the Purchasing Agents Association of Washington, D. C. was held in the Burlington Hotel on January 11, with President K. M. Pardoe presiding. "It Must Be Somewhere", a 28-minute color sound film portraying the significance of modern filing methods was shown through the courtesy of Remington Rand, Inc. The film takes an executive and his office staff through a series of episodes that dramatize the importance of simplified records management.

HARBOR OFFICIAL GUEST AT HAWAII MEETING

Ben F. Rush, engineer-manager of the board of harbor commissioners, was guest speaker at the December 16 meeting of the Purchasing Agents Association of Hawaii.

He spoke of the $2,900,000 new pier project to be constructed at the Waikiki end of Honolulu harbor.

President J. V. Kielbauch told association members of plans being formulated for a joint meeting with the Sales Executives of Hawaii. The meeting was scheduled to be held in January.

"POWER LOAD PROSPECTS" COLUMBUS MEETING TOPIC

A dinner meeting of the Columbus Association of Purchasing Agents was held in the Gold Room of the Fort Hayes Hotel on Monday, January 10.

Guest speaker was Charles B. Stainback, industrial syndicate manager of Westinghouse Electric Corp., whose subject was "Prospects for Future Industrial Power Load". He used colored slides with his talk.

"BACK DOOR SELLING" TOPIC AT NEW YORK FORUM

"Is Back-Door Selling an Evil?" was the subject of an interesting talk by Harry G. Specht, vice president of the Eastwood Nealley Corporation, Belleville, N. J., at Forum meeting of the Purchasing Agents Association of New York, preceding that body's 345th meeting at the Builders' Exchange Club, New York, on January 18th.

In the course of his talk Mr. Specht, whose paper will appear in the next issue of PURCHASING, enumerated several factors that are responsible for salesmen making efforts to by-pass the purchasing agent, such as unfair treatment, unethical requests, lack of factual knowledge of why they did not get an order, and several other reasons, and he emphasized that when a purchasing agent refuses to

(*Please turn to page* 282)

The use of Weirton cold-rolled strip steel can be a big factor in maintaining high volume at low cost in the making of countless articles or parts. Its exceptional drawing and forming qualities speed up and simplify production. Costs are cut because spoilage and scrap losses and tool expense are reduced. Plant efficiency and product efficiency are improved through standardization on Weirton cold-rolled strip steel.

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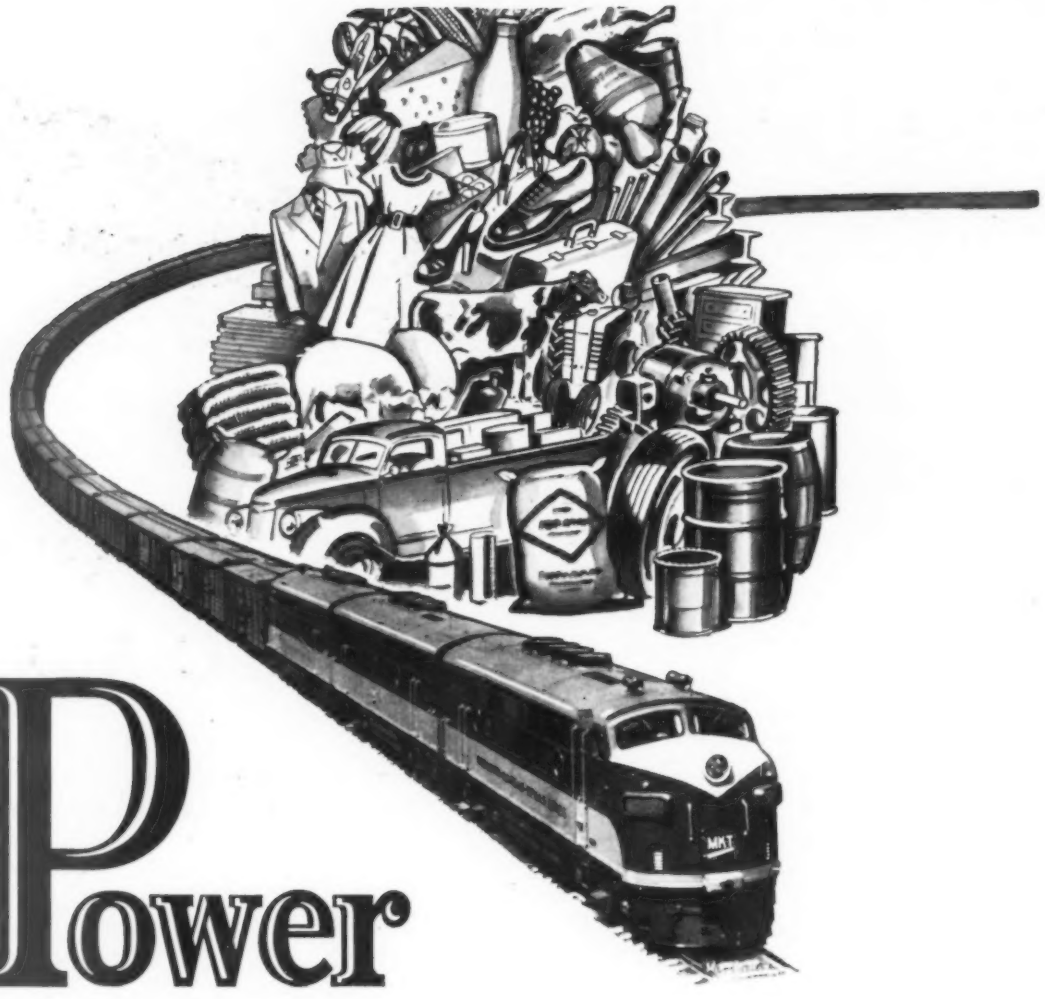
WEIRTON, W. VA., *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION,** *Executive Offices, Pittsburgh, Pennsylvania*

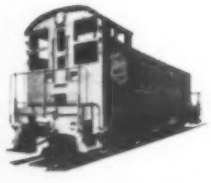


the Power

to move Mountains of Freight

NEW MERCHANDISE CARS
... hundreds of them, augment Katy's fleet of heavy cargo transportation.

NEW HOPPER CARS
... available for quick, efficient, versatile service to shippers.



NEW DIESEL POWER
... to expedite transfer of your freight at major terminals — and road haul it with speed and economy.

YOURS ON THE *Katy*

SMOOTH DIESEL POWER ... to deliver your goods in perfect condition. High-speed power that permits scheduling to suit your every shipping need.

DIESEL POWERED SWITCHERS ... at important terminals to expedite the transfer of your carloads to markets and factories.

RADIO POWER ... a magic service PLUS to speed handling of your freight.

Katy's equipped for even heavier, longer hauls, smoother handling of your shipments—dependable, on-time service between Texas and Oklahoma and the North. For careful, precision shipping to and from the Southwest... ship KATY!

MISSOURI-KANSAS-TEXAS LINES

Ship Via The Southwest's Main Supply Line

KATY BULLET
Daily from Kansas City and St. Louis to all main Southwestern points.

KATY KOMET
Katy's fastest—Southbound daily from St. Louis to all main-line points.

KATY KLIPPER
Daily, St. Louis and Kansas City to Oklahoma and Texas.

KATY PACKER
Northbound daily, Fort Worth to Kansas City and St. Louis.

"72" FAST FREIGHT
Daily from Texas and Oklahoma to Kansas City and St. Louis.

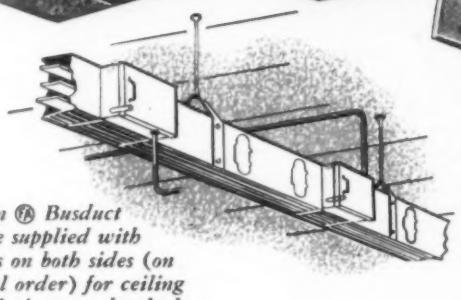
Also... Convenient Double Daily Service between St. Louis and Kansas City.

M·K·T
KATY RAILROAD
MISSOURI-KANSAS-TEXAS

178

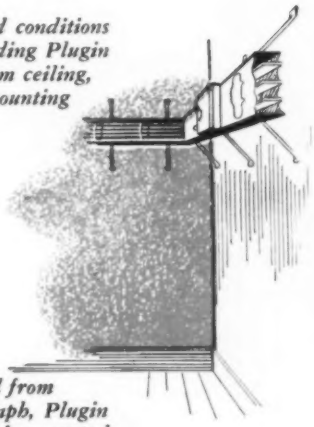
From any ANGLE . . .

IT'S . . . PLUGIN (FA) BUSDUCT

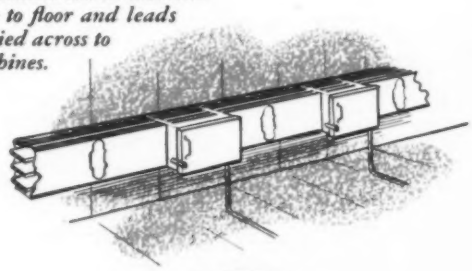


Plugin (FA) Busduct can be supplied with outlets on both sides (on special order) for ceiling installations, as sketched above . . .

Or, if overhead conditions prevent suspending Plugin (FA) Busduct from ceiling, special wall-mounting brackets are available . . .



Or, as sketched from actual photograph, Plugin (FA) Busduct can be mounted close to floor and leads carried across to machines.



Take the economy angle! Plugin (FA) Busduct permits a quick change in plant or electrical layout *without* disrupting production . . . eliminates costly temporary connections and expensive, long lead-ins . . . and greatly reduces maintenance costs and voltage losses.

Take the flexibility angle! Plugin (FA) Busduct provides a ready power source for new and present equipment anywhere along the line . . . *a plugin outlet* every foot of the way. Available in standard 10-foot lengths, (FA) Busduct can be installed on, or hung from ceilings, along walls, and even above baseboards . . . through tunnels under streets, through roofs or walls . . . and with dustproof or raintite protection.

Take the efficiency angle! Plugin (FA) Busduct saves much needed time in the installation and relocation of machinery and in day-to-day maintenance of the electrical system.

For more information see your (FA) Representative (he's listed in Sweet's) or write for Busduct Bulletin No. 701.

You'll agree that Plugin (FA) Busduct is the Most Economical Path From Power Source to Equipment.

FA TRADE MARK

Frank Adam Electric Co.

ST. LOUIS 13, MISSOURI

Makers of BUSDUCT • PANELBOARDS • SWITCHBOARDS • SERVICE EQUIPMENT • SAFETY SWITCHES • LOAD CENTERS • QUIKHETER

Good Fasteners

- because they are uniform
- because they are made by CORBIN

Your fastening needs – for wood, metal, or composition – are served better with *uniform* Corbin Screw products. You cut costs by speeding assembly – your assemblers drive hour after hour without hitting a bad one. You increase profits by improving quality – test-checked Corbin fasteners do what they're made for, longer and better.

—and many other types of fasteners, in styles and sizes to meet every fastening need.

ALWAYS ASK FOR FASTENERS MADE BY...

CORBIN SCREW

DIVISION

THE AMERICAN HARDWARE CORPORATION • NEW BRITAIN, CONN.
Warehouses: New Britain • New York • Chicago

(*Continued from page 278*)

see a salesman when the latter calls, he invites back door selling. He stated that purchasing has a definite service job to do in treating with salesmen and that if it can do the job intelligently, giving the other departments of the business the service they expect, and cooperate with them, there will be no serious problems from the standpoint of back-door selling.

At the regular monthly dinner meeting following the Forum, President Donald H. Lyons commented upon the unusually large attendance at the first 1949 meeting, expressing the pleasure of the officers and committees. He announced that the association's annual Purchasing-Sales Dinner would be held at the Hotel Commodore, New York City, February 15; also, the appointment of Frank J. D'Antonio of the Charles Pfizer & Company, Inc., to succeed Frank Soule, retired as member of the executive committee.

National Association Membership Passes 12,000 Mark

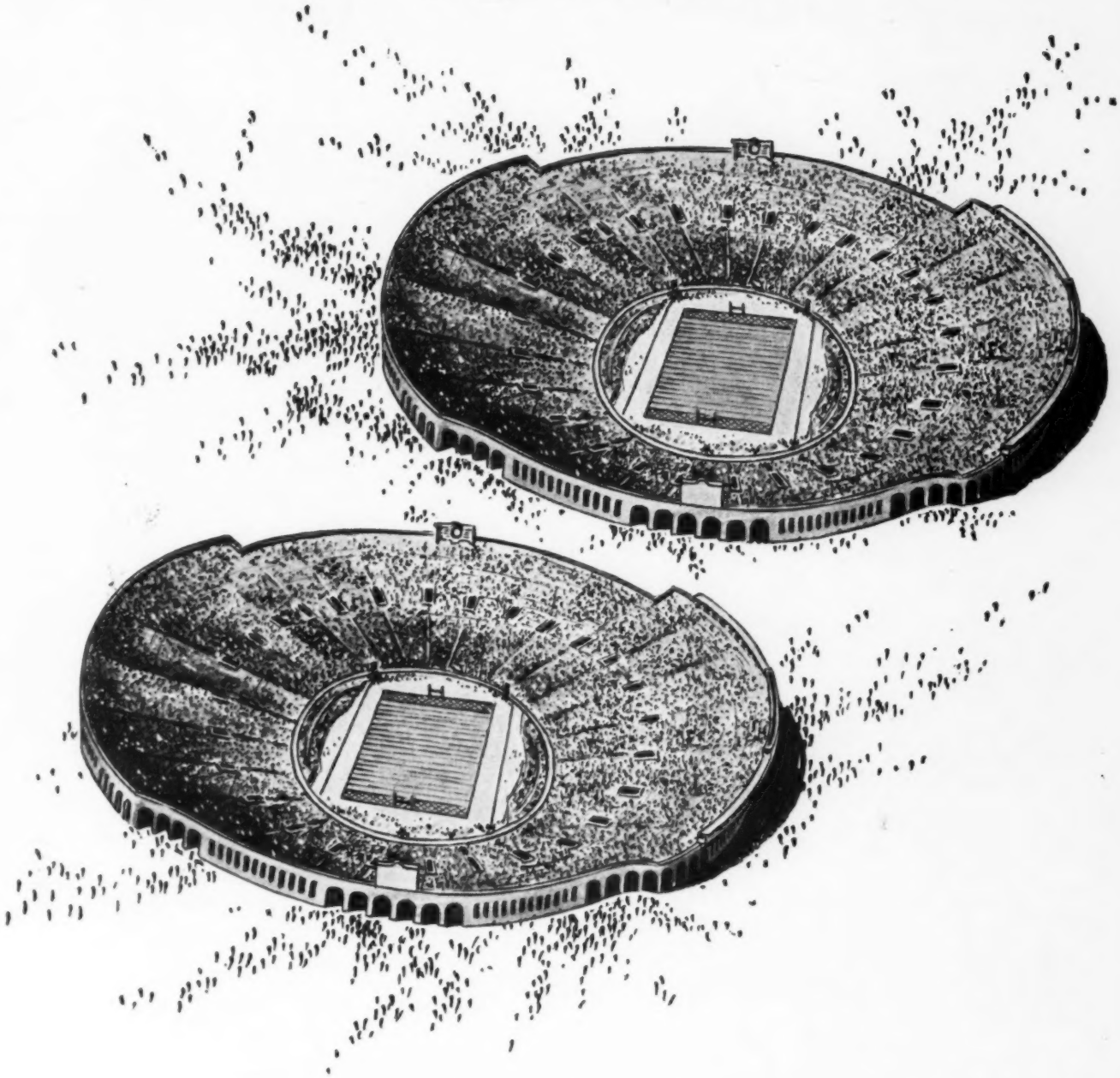
David Meeker, The Paraffine Companies, Inc., national director, announced that the membership of the National Association had passed the 12,000 mark, and that the Chicago association recently added the 800th name to its membership roster. The New York Association now has 775 members.

Leo Wolman, Professor of Economics, Columbia University, New York, was the dinner speaker, his subject being "The Current Inflation." He expressed the opinion that post-war inflation had run its course. Querying why we have to have booms and busts, he said that it is like asking why do we have to have trouble from time to time. Booms and busts are like that, he said. They are forms of trouble and we must not overlook that we have through five years of about as great destruction as the world could possibly stand. He expressed doubt that inflation could be perpetuated for long even by such inflationary influences as the $42,000,000,000 Federal budget, stating that there is increasing evidence that the postwar boom, the race to supply deficiencies, has passed the peak. The big question, he said, is whether we have enough intellectual resources in management, in labor and in government to make the necessary adjustments and make them quickly. Let the labor leaders and the business men do a job, he said. The big job is to cut out the waste; everybody knows it can be cut out in overhead, in labor cost, and by cutting out an awful lot of slack. There is a tremendous amount of work to be done in this country if costs and prices get nearly right.

Plan for the Future

"The thing to do is to look ahead and to begin now to figure on what to do if things are not quite as good as they are today. We better begin to figure about the future and put ourselves in shape to deal with a possible decrease in business. If it doesn't happen we won't lose anything. If it does, my guess is that it won't be as bad as 1929, but it will not be anything that will be over in a couple of months."

Two big "bowlfuls"



240,000 passengers travel in one week on the scheduled airlines of America. They travel with speed, comfort and confidence, surrounded by all modern conveniences and safeguards, many of which are storage battery powered. Exide Aircraft Batteries are used on the planes of leading air transport companies.

Supplying electric power for aircraft is but one of numerous vital services performed by Exide Batteries. For there are Exides for every storage battery need. They provide motive power for battery electric trucks and mine haulage units. In railroad service they furnish power for lighting and air-conditioning passenger cars. Diesel locomotive cranking and signal systems. Exide Batteries are used by telephone and telegraph companies, radio and television stations, public utilities . . . and by many others. And on millions of cars, trucks and buses, they prove daily that "When it's an Exide, you start."

Information regarding the application of storage batteries for any business or industrial need is available upon request.

Exide
BATTERIES
"Exide" Reg. Trade-Mark U. S. Pat. Off.

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

1888 . . . DEPENDABLE BATTERIES FOR 61 YEARS . . . 1949

Want Additional Product Information? See Page 19.

overcoming an underwater problem for the Northern Pacific

► Spanning the St. Louis River, linking Duluth, Minn. to Superior, Wisconsin, swing bridges are operated by the Northern Pacific Railway, "Main Street of the Northwest." Heavy traffic depends upon their smooth electrical opening and closing. For these conditions the railroad wanted a submarine power cable of exceptionally long-lasting service life.

The choice was an Okonite submarine cable. The installation called for 3600 feet of 3-conductor cable. Conductors: Okoloy-coated for corrosion resistance, Semi-con-taped to prevent internal corona cutting. Insulation: long-lived Okolite. Armor: Galvanized steel armor wire. O. D. of cable: 2.390". Weight: 5 lbs. per foot.

While moisture-resistance is, of course, an essential, perhaps the most important single factor in this cable's selection is the consistently stable electrical characteristics of Okolite high-voltage insulation even when submerged without an outer lead sheath.

Utilities, carriers, industrial plants use many kinds of Okonite cables — for wet locations, for hot spots, for extreme flexibility, for indoor and outdoor use above or below ground including direct burial. Write for Bulletin PG-1036. The Okonite Company, Passaic, N. J.

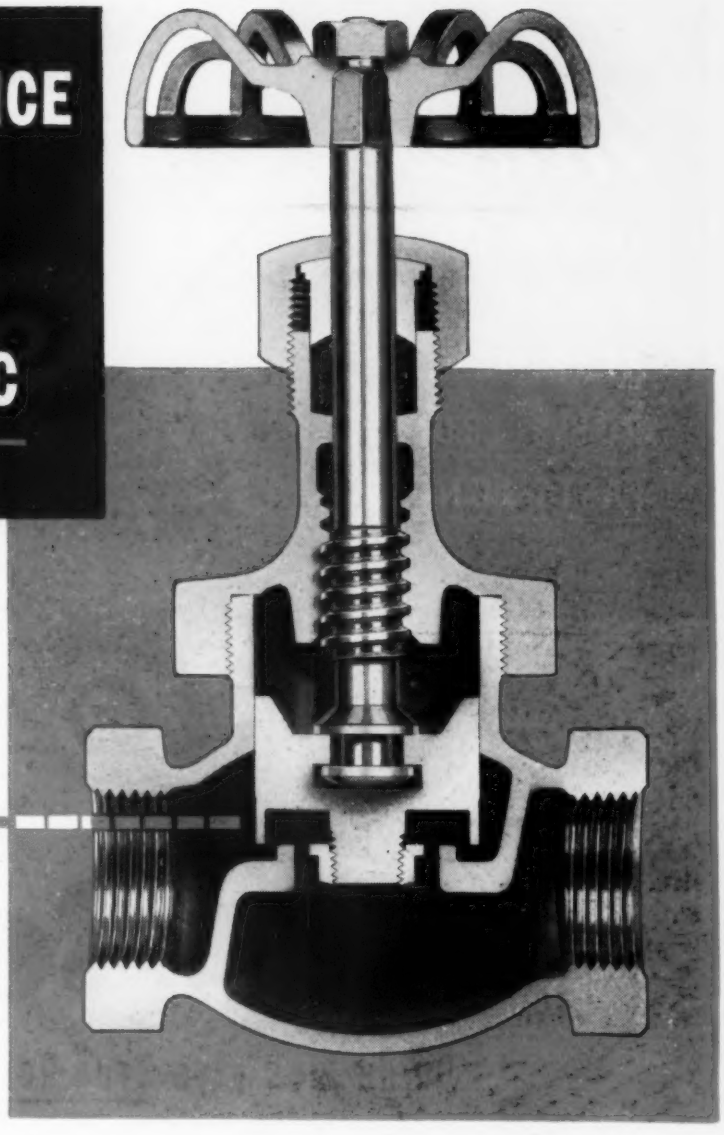
6879

OKONITE OKONITE SINCE 1878 **insulated wires and cables**

THE BEST CABLE IS YOUR BEST POLICY

Want Additional Product Information? See Page 19.

CUT YOUR MAINTENANCE "DOWN-TIME" WITH O-B's SELF LEVELING DISC



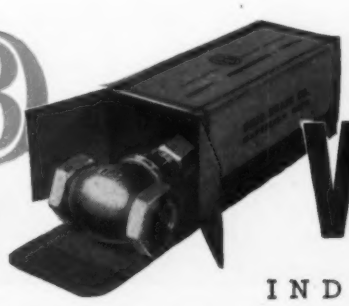
Shutdowns of your pipelines are necessary for regular maintenance of flow control valves. But extra shut downs to make emergency valve repairs or replacements can cause costly, unscheduled production stoppages. Just a few leaky valves that fail to live up to service expectations can cause maintenance bills to rocket out of sight.

Worn discs, gouged out by the seat of the valve, just can't shut off tightly. This kind of wear is kept to a minimum with the self-leveling disc in the Ohio Brass Number 11 line screw-over bonnet valve for all 150 W.S.P.--300 W.O.G. services. Long ribs on the disc holder guide the disc to a perfectly level, leak-proof contact with the entire seat surface as the valve is closed. This self-leveling of the disc, combined with its full swivel on the stem, prevents any twisting and cutting of the disc by the seat.

On your next order for general-purpose, maintenance valves, specify O-B Number 11 line for long-wearing service from your local Ohio Brass distributor.

OHIO BRASS COMPANY, MANSFIELD, OHIO

2997-V



Ohio Brass VALVES

FOR DOMESTIC AND INDUSTRIAL USE

Want Additional Product Information? See Page 19.

Newest

LOWER-COST ROLLER BEARING... ROLLS TRUER! LASTS LONGER!

ROLLWAY

Tru-Rol

Guide Lips give True Rolling

Here's a new low-cost bearing that's an efficient running mate for Rollway's famous bronze retainer bearings. It's been thoroughly tested and proved . . . gives remarkable performance in those uses where there has to be just the right balance between the economy and precision factors of bearing selection.

Maintained Alignment

The "Guide-Lips" on Rollway's TRU-ROL roller bearings are curved flanges, deep and broad in the retainer pockets.

They guide each roller in truer alignment. They convey a thin film of lubricant to each roller . . . and keep it there. They maintain correct roller alignment, reduce wear and maintenance costs.

Tru-Rol
The new lower-priced bearing with top performance!

ROLLWAY
BEARING COMPANY, INC.
SYRACUSE, N. Y.

Sales Offices: Philadelphia • Boston • Pittsburgh • Cleveland • Detroit • Chicago
Minneapolis • Birmingham • Houston • Los Angeles

A.S.T.E. ANNUAL MEETING TO BE HELD IN PITTSBURGH

The Seventeenth Annual Meeting of the American Society of Tool Engineers will be held March 10, 11 and 12 in Pittsburgh, at the William Penn Hotel. In addition to the technical sessions, the following plant tours are scheduled: National Supply Co., Westinghouse Electric & Mfg. Co. Nuttall Div., J. H. Matthews & Co., Aluminum Co. of America, Carnegie-Illinois Steel Corp., Firth-Sterling Steel Corp., Gulf Oil Co. Research Laboratories; Westinghouse Air Brake Co. Industrial Divn., and Westinghouse Electric & Mfg. Co. Complete information about the meeting may be secured from J. M. Cannon Associates, Inc., 523 Penobscot Building, Detroit, Mich.

SYLVANIA LIFTS RESTRICTIONS ON FLUORESCENT GUARANTEE

Two changes in its One-Year fluorescent lighting Fixture Guarantee have been made by Sylvania Electric Products Inc., Fred W. Fulle, merchandising manager of the company's Lighting Fixture Division, announces.

The guarantee, which was previously limited to orders of 100 or more lighting fixtures, now applies to purchases of 25 or more fixtures. Also, Mr. Fulle revealed, the limitation requiring that fixtures be installed in one location has been removed.

The latter revision will permit customers who buy in large quantities to install fluorescent fixtures in their various branches, but for the guarantee to be effective, individual guarantee application forms must be filled out and signed by the responsible party in the particular location where the fixtures are installed. It will also be necessary for such forms to be cleared through the central purchasing office of the company placing the order, so that both the company and Sylvania Electric can keep the necessary records.

Introduced last March, the guarantee applies to all parts of Sylvania fixtures, including fluorescent lamps, starters, ballasts, lampholders, reflectors, glass shields and metal parts. By its terms Sylvania agrees to replace any parts which become defective under normal conditions of use within one year of the date of installation.

DISCONTINUE CELLULOSE NITRATE PLASTIC PRODUCTS PRODUCTION

The manufacture of all cellulose nitrate plastic products is being discontinued by Celanese Corporation of America, W. Stuart Landes, vice president in charge of the plastics division, announced recently. All future activities of the plastics division are to be concentrated in the fields of cellulose acetate, cellulose propionate and other new materials now in the development stage.

(*Please turn to page* 288)

Arc-welding Accessories

Pay off!

INCREASED PROTECTION

BETTER WELDING

LONGER LIFE

NEW COVER GLASS

All these features . . . at no extra cost

1. Longer life use due to improvement of formula
2. Shop-tested by welders within our own plant
3. Controlled baking period
4. Careful attention to cleanliness
5. Treated on both sides

For more detailed information, see your local G-E Arc-welding Distributor, or fill out the coupon and mail it today. We will send you a copy of the easy-reference G-E Arc-welding Accessory Catalog.

Copyright 1948, General Electric Co.

GENERAL ELECTRIC, Section C672-102
Apparatus Dept., Schenectady 5, N. Y.

Please send me, without obligation, G-E Arc-welding Accessory Catalog GEC-253.

Company.....

Name.....

Address.....

City.....State.....

ARC WELDERS • ELECTRODES • ACCESSORIES

GENERAL ELECTRIC

Want Additional Product Information? See Page 19.

Cleveland Container Products

Serve Many Purposes and Fields of Activity

All are quality products . . . rightly priced . . . rapidly produced. Our Creative Design and Engineering Departments are at your service.

For the latest data and ideas check the items of interest to you.

_____ Spirally wound Tubes, Cores and Cans.
_____ All fibre and combination fibre and metal cans.
_____ Friction plug, slip cover, screw cap containers.
_____ Paper thread protectors for male threads (tubes) for female threads (plugs).
_____ Paper discs.
_____ Kraft and fish paper tubes for coil forms and condenser covers.
_____ Cosmalite—spirally laminated paper base phenolic tubing for the electrical industry.

Your inquiry will be given immediate attention.

May we serve you?

The CLEVELAND CONTAINER Co.
6201 BARBERTON AVE. CLEVELAND 2, OHIO
• All-Fibre Cans • Combination Metal and Paper Cans
• Spirally Wound Tubes and Cores for all Purposes
• Plastic and Combination Paper and Plastic Items

PRODUCTION PLANTS also at Plymouth, Wisc., Ogdensburg, N.Y., Chicago, Ill., Detroit, Mich., Jamesburg, N.J.
PLASTICS DIVISION at Plymouth, Wisc. • ABRASIVE DIVISION at Cleveland, Ohio
SALES OFFICES: Room 5632, Grand Central Term. Bldg., New York 17, N.Y., also 647 Main St., Hartford, Conn.
CANADIAN PLANT: The Cleveland Container Canada, Ltd., Prescott, Ontario

CAN BE BOLTED TOGETHER TO FORM A *continuous* BENCH . . .

Fig. 732
Pat'd and Pats. Pending.
Drawer is extra.

HALLOWELL

READY-MADE WORK BENCHES OF STEEL

Made in 4 standard heights, 3 widths and 7 lengths, these "Hallowell" units can be used either individually or bolted together to form a continuous work bench — most any length — a money-saving feature not practicable with "nailed-together" wooden benches.

The serviceable, *ready-made* "Hallowell" Work Benches of Steel are ideal equipment for modern shops. "Hallowell" Benches have smooth, long-wearing steel tops, are also available with heavy, high-grade laminated wood tops . . . or steel tops covered with "Tempered Presdwood".

The "Hallowell" — rigid as a rock — does *not* require costly bolting to the floor.

Write us for the name and address of your nearest "Hallowell" Industrial Distributor and for your copy of the "Hallowell" Catalog.

OVER 46 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNSYLVANIA, BOX 590
CHICAGO • DETROIT • ST. LOUIS • SAN FRANCISCO

(*Continued from* page 286)

All of the cellulose nitrate operations of the company, as well as a major part of other plastic activities, had been carried on until recently at the Newark plant. Some cellulose nitrate manufacturing operations have already been halted and it is expected that a complete cessation will result before the middle of the year.

The Newark plant will continue to produce cellulose acetate sheets, films and foils and additional production facilities are presently being installed.

"In relationship to other plastics," Mr. Landes stated, "the position of cellulose nitrate has steadily deteriorated in recent years. In 1931 cellulose nitrate production accounted for more than 90 per cent of the total cellulosics plastics production in the country, but in 1947 accounted for only 13 per cent.

"Technological advances in the fields of cellulose acetate, cellulose propionate and other materials during recent years suggest a further widening of the gap between such materials and cellulose nitrate.

"Cellulose acetate is taking over many of the applications of cellulose nitrate, as it has many of the advantages of that plastic without its flammability."

WIRE PRODUCTS AND THEIR CLASSIFICATIONS

Wire is broadly classified into two main divisions in the Carbon Steel Manual, namely (1) Merchant Wire Products, and (2) Manufacturers Wire, according to H. A. Caldwell, chief metallurgist, Tennessee Coal, Iron and Railroad Company and C. L. McGowan, superintendent Wire Mill, Atlantic Steel Co., who defined wire products in paper presented at Birmingham technical meeting of the American Iron & Steel Institute, as follows:

Manufacturers Wire, as its name implies, is wire which is generally sold to industry for manufacture into a wide variety of products.

The classification Merchant Wire and Merchant Wire Products includes such commodities as wire nails and staples; barbed wire; twisted fence stays; wire fence, including farm field fence, poultry fence, ornamental lawn fence and diamond mesh fence; annealed and galvanized fence wire; merchant wire; single-loop bale ties and single-loop bale-tie wire; and wire hoops.

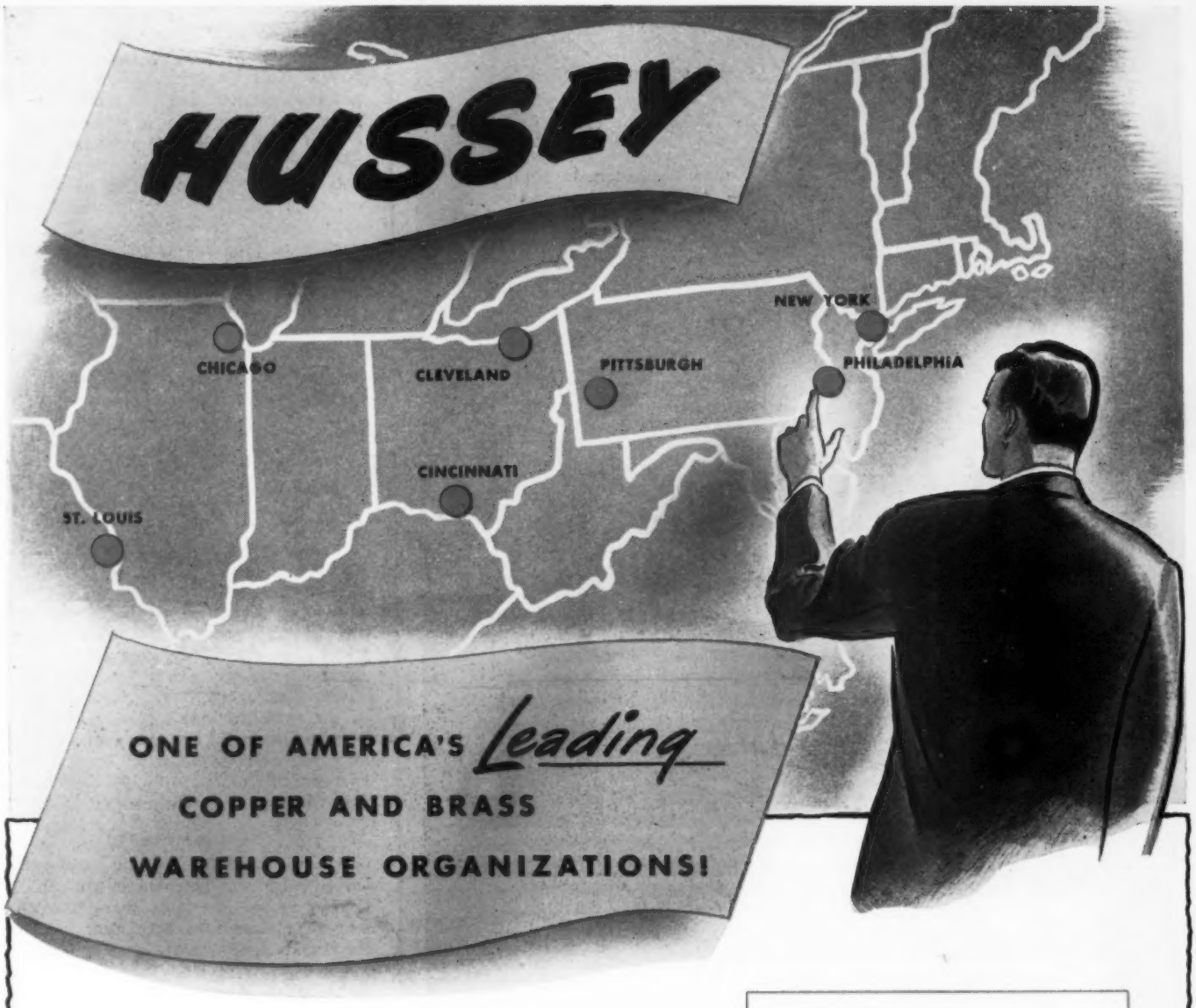
In general, Merchant Wire and Merchant Wire Products are not subject to specifications involving specified chemical or mehanical requirements.

From a tonnage standpoint some of the largest items in the Merchant Wire and Merchant Wire Products classification are:

Nails and Staples

Wire nails were first made in the United States about 1851. In 1875 the manufacture of wire nails was started in Covington, Kentucky, on some machines imported from Germany, where the art of making wire nails was practiced, and

(*Please turn to page* 290)



In the heart of America's busiest heavy industrial areas you'll find Hussey Copper and Brass Warehouses serving every industrial and construction requirement for these "Lifetime Metals." Your Hussey representative is only a few miles from you at any time—or as near as your phone! For the kind of copper and brass service you have been "unaccustomed to" since pre-war days—call on your nearest Hussey Copper and Brass Warehouse today!

C. G. HUSSEY & CO.
(Division of Copper Range Co.)
ROLLING MILLS AND GENERAL OFFICES: PITTSBURGH, PA.

Hussey Warehouses Carry Stocks of
Copper and Brass Products for Prompt Delivery

NEAR YOU *for service!*

- 5318 St. Clair Ave. Cleveland, Ohio
- 1620 Delmar Blvd. St. Louis 3, Missouri
- 3900 N. Elston Ave. Chicago, Illinois
- 424 Commercial Square Cincinnati 2, Ohio
- 1632 Fairmount Ave. Philadelphia 30, Penna.
- 2850 Second Avenue Pittsburgh 19, Penna.
- 140 Sixth Avenue New York, New York

HUSSEY

ALL HUSSEY WAREHOUSES CARRY
COPPER ARMORED SISALKRAFT

CLARK

YOUR BREAKFAST SIR—
"Fresh as a Daisy!"

"Fresh As A Daisy" is the spirited slogan in the huge, immaculate Kellogg plant—and the efficient handling of materials in warehousing, processing and moving cereal foods to the world's breakfast tables, helps to deliver them to you—"Fresh As A Daisy."

To assist in speeding these fresh, crisp products on their way, thirty-one Clark fork-lift trucks each operate on an average of twenty-one hours per day. In this fashion, modern materials handling methods and machines contribute to a half century of progress and achievement in the manufacture of Corn Flakes.

There is hardly a business, no matter how large, no matter how small, in which employment of modern materials handling methods and machines cannot accomplish efficiencies and economies so important that, as in the case of Kellogg's, they can be shared even by end-product consumers.

Clark will be glad to work with you to eliminate inefficiencies and extravagances of "multiple handling," and to help you discover new opportunities for savings on handling operations. At no cost, but with a high promise of large profit, you can: CONSULT CLARK.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS
AND INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 23, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

(*Continued from page 288*)

this grew into the American Wire and Screw Nail Company. Wire nails won quick acceptance, and the growth of the industry was such that by 1886 an Association of Wire Nail Manufacturers had been formed and issued a wire nail card, and by 1890 the production of the old cut nails had practically ceased. To-day approximately twenty per cent of all the steel wire produced is made into nails.

Nail manufacturers have been active in devising new types of nails, new heads and points to meet various nailing requirements, special coating to provide increased holding power, and special finishes for certain applications. There became such an enormous number of sizes and types of nails that an American Iron and Steel Institute Subcommittee on Simplification of Standards for Nails and Staples, Barbed Wire and Woven Wire Fence undertook an extensive study after which recommendations were made to the division of Simplified Practice of the Bureau of Standards as to the types and sizes of nails and staples that should be considered standard. Twenty-nine types of nails and staples were proposed, with tables of standard sizes and size designation for each. After having been accepted by several hundred of the principal manufacturers, distributors, and users, the recommendations were approved and promulgated by the Department of Commerce in 1947 in Simplified Practice Recommendation R-223.

Barbed Wire

A machine for making two-point barbed wire was patented by Joseph F. Glidder in 1874, and six years later the four-point wire was developed. Due to the rapid development of the western ranges and farm lands about this time there was an enormous demand for barbed wire and the growth of the industry was rapid.

In barbed wire fence, two wires, usually galvanized but sometimes painted, known as line wires, are twisted together and at regular intervals the barbs are wound about one or both of the line wires.

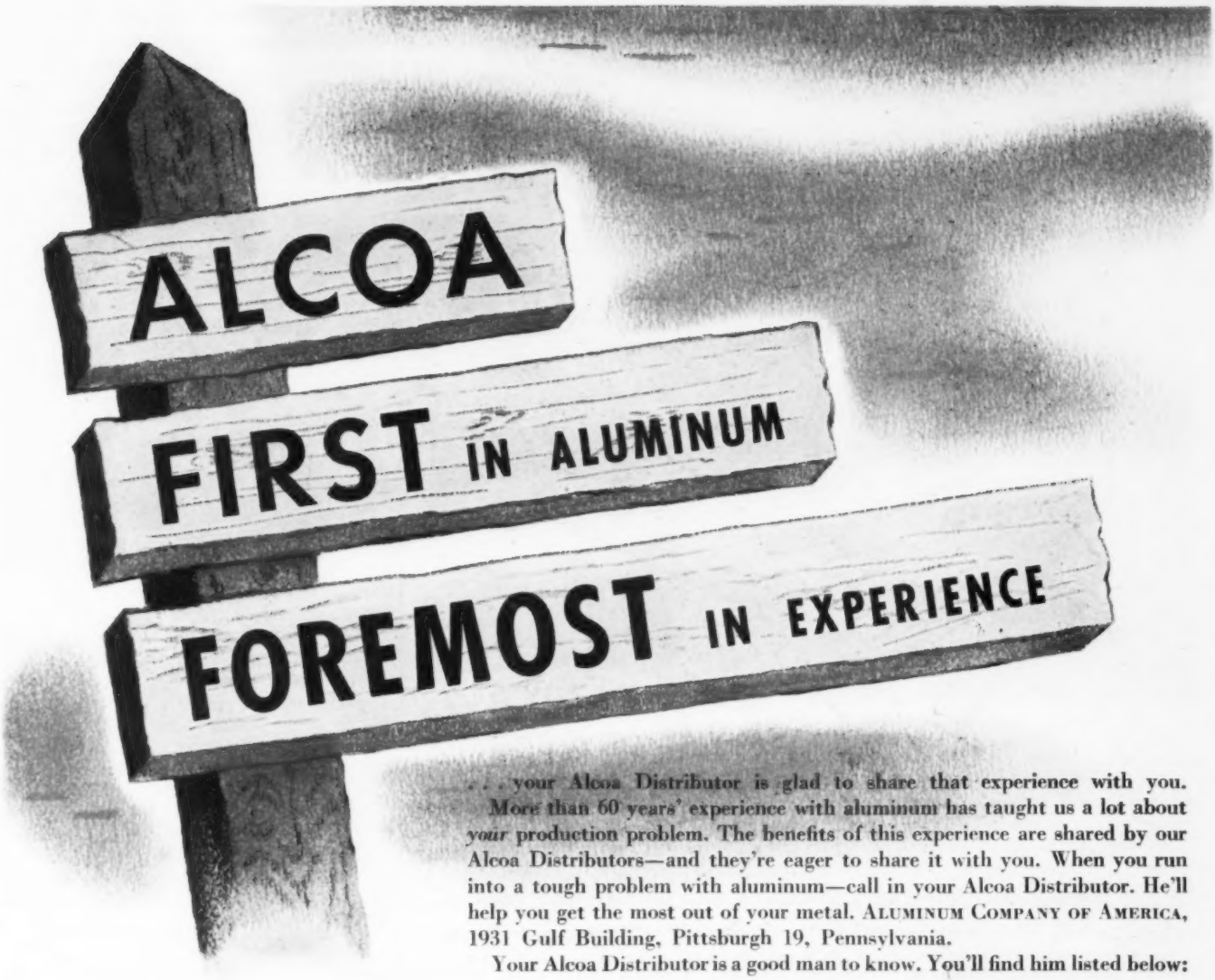
Generally speaking, there are two types of barbed wire, the hog with barbs close together and the cattle with barbs further apart. The two-point barbs are formed of one wire and the four-point of two wires. There are three kinds of barbs, speaking from a standpoint of the cross-section, the flat, the half-round, and the full round. There are various methods of wrapping the barbs around the strand, that is, wrapping once around one wire and once around both; wrapping twice around one wire; wrapping around one wire once; or wrapping once around each cable.

The wire is marketed in 80 rod, or in catchweight spools.

Woven Wire Fence

A very large tonnage of galvanized wire is fabricated into woven wire fencing. Woven wire fencing is manufactured in wide range of types which vary in

(*Please turn to page 292*)



. . . your Alcoa Distributor is glad to share that experience with you.

More than 60 years' experience with aluminum has taught us a lot about *your* production problem. The benefits of this experience are shared by our Alcoa Distributors—and they're eager to share it with you. When you run into a tough problem with aluminum—call in your Alcoa Distributor. He'll help you get the most out of your metal. ALUMINUM COMPANY OF AMERICA, 1931 Gulf Building, Pittsburgh 19, Pennsylvania.

Your Alcoa Distributor is a good man to know. You'll find him listed below:

Atlanta, Georgia
- J. M. Tull Metal & Supply Co., Inc. Phone: WAlnut 3525

Baltimore, Maryland
- Whitehead Metal Products Co., Inc. Phone: LAfayette 2300

Boston (Cambridge) Massachusetts
- Whitehead Metal Products Co., Inc. Phone: TRowbridge 6-4680

Buffalo, New York
- Brace-Mueller-Huntley, Inc. Phone: RIverside 2620
- Whitehead Metal Products Co., Inc. Phone: CLeveland 1475

Charlotte, North Carolina
- Edgcomb Steel Company Phone: 4-9768

Chicago, Illinois
- Central Steel & Wire Company Phone: REpublic 7-3000
- Steel Sales Corporation Phone: BIshop 7-7700

Cincinnati, Ohio
- Williams & Company, Inc. Phone: CApitol 3000

Cleveland, Ohio
- Williams & Company, Inc. Phone: UTah 1-5000

Columbus, Ohio
- Williams & Company, Inc. Phone: MAin 3291

Dallas, Texas
- Metal Goods Corporation Phone: DIxon 4-3925

Detroit, Michigan
- Steel Sales Corporation Phone: TYler 6-3000

Houston, Texas
- Metal Goods Corporation Phone: BEacon 3-8881

Kansas City, North, Missouri
- Metal Goods Corporation Phone: NOrclay 3516

Los Angeles, California
- Ducommun Metals and Supply Co. Phone: KImball 0161
- Pacific Metals Company, Ltd. Phone: PRospect 0171

Newark, New Jersey
- Whitehead Metal Products Co., Inc. Phone: BIgelow 8-8500

New Orleans, Louisiana
- Metal Goods Corporation Phone: CAnal 7373

New York, New York
- Whitehead Metal Products Co., Inc. Phone: WAtkins 4-1500

Philadelphia, Pennsylvania
- Edgcomb Steel Company Phone: GArfield 3-6300
- Whitehead Metal Products Co., Inc. Phone: BAldwin 9-2323

Pittsburgh, Pennsylvania
- Williams & Company, Inc. Phone: CEdar 8600

Portland, Oregon
- Pacific Metal Company Phone: BRoadway 0695

Rochester, New York
- Brace-Mueller-Huntley, Inc. Phone: GLenwood 0962

San Francisco, California
- Pacific Metals Company, Ltd. Phones: MIssion 7-1104 ENterprise 1-0806

Seattle, Washington
- Pacific Metal Company Phone: MAin 6925

St. Louis, Missouri
- Metal Goods Corporation Phone: GOodfellow 1234

Syracuse, New York
- Brace-Mueller-Huntley, Inc. Phones: SYracuse 73-3341 9-6621
- Whitehead Metal Products Co., Inc. Phone: SYracuse 5-4112

Toledo, Ohio
- Williams & Company, Inc. Phone: ADams 8101

Tulsa, Oklahoma
- Metal Goods Corporation Phone: 4-1175

ALCOA FIRST IN ALUMINUM

Would you buy a Gross of Assorted Tools?

THEN WHY BUY A GROSS OF ASSORTED WIPING CLOTHS?

KEX Industrial Wiping TOWELS are important tools—designed, like any special tool, for a specific purpose.

They aren't makeshift . . . they aren't discards that have outlived their original usefulness. They've been designed from their beginning to do your important wiping jobs, carefully, efficiently and economically.

KEX Industrial Wiping Towels are:

1. Actually precision items for wiping purposes *only*.
2. Soft, woven cotton with no abrasives to mar delicate surfaces.
3. Bound at the edges for safe use.
4. Made a convenient, uniform size for complete usability.
5. Scientifically cleaned by special high heat to remove all soil.
6. Rented—nothing to buy, no expensive inventory—just a low monthly rental charge.

Kex Towels are delivered in neat bundles, in desired quantities for easy storage, convenient handling and control of distribution. See your classified telephone directory for nearest KEX Distributor, identified by this trade-mark.

Or write for details, to KEX INDUSTRIAL SERVICE, 295 Fifth Avenue, New York 16, N. Y.

KEX

"KEX" NATIONAL SERVICE

REG. U.S. PAT. OFF.

(*Continued from page* 290)

style or design, and each type may be made up in many different sizes. In general all types resemble, in that they have several lateral or horizontal wires which are secured with vertical or diagonal stay wires, forming meshes of varying sizes depending on the intended use, the meshes being large for cattle, smaller for hog and still smaller for poultry. The horizontal wires contain tension curves which enable the fence to stretch better and allow for expansion and contraction due to temperature changes.

As in the case of nails and staples, an American Iron and Steel Institute Subcommittee has cooperated with the Division of Simplified Practice of the Bureau of Standards and agreed on a simplified list of types and sizes of woven wire fence that are recommended as standard in the industry. This list has been promulgated by the Department of Commerce as Simplified Practice Recommendation R 9-47.

Bale Ties

Bales ties are manufactured in a complete range of sizes for baling hay, straw, excelsior, rags, paper, etc. They are made from wire specially produced to meet specific requirements of strengths and still have enough ductility to withstand the twisting necessary in forming the fastening loops. There are two grades of bale tie, the Single Loop, having a tensile strength of 65,000 lbs. per sq. in. minimum and Cross Head, having a tensile strength of 140,000 lbs. per sq. in. minimum. Both types vary in gauge from 12 to 16½ and are generally furnished as strand annealed wire with a light oxide finish.

Wire Hoops

There are two styles of wire hoop, the twisted splice, and electric welded. The twisted style of hoop is used principally for slack cooperage and to a small extent as reinforcement in cylindrical concrete work. This style of hoop is objectionable for smooth finished woodenware packages, because the twisted splice mars the package slightly in driving the hoop in place. The electric welded style of hoop is used on finely finished woodenware packages, also as reinforcement in cylindrical concrete work. This style of hoop can be used for any purpose for which a wire hoop is wanted.

Stone Wire

Stone wire is an ordinary grade of annealed or soft galvanized wire for common uses such as stovepipe wire, haystack wire, tying wire, and for general home and farm utility purposes. As put up, it usually consists of one to three pieces in 12 pound coils of 8 inch diameter.

Conclusions

The few wire products that have been briefly described, while important from a tonnage standpoint, are but a few of the thousands of commodities made from wire. The great number of sizes, shapes

(*Please turn to page* 294)

Shown here is one view in the spotless modern plant where Swift's Animal Protein Colloid is made. Operation is continuous, automatic . . . the product is "untouched by human hands," not contaminated by foreign substances.

Investigate this Modern Process Agent:

Swift's Animal Protein Colloid*

(made from an exclusive Swift Process)

Does your manufacturing process require . . .

1. An emulsifier?
2. A flotation agent?
3. A gel structure?
4. A settling agent?
5. A protective coating?
6. A sizing agent?
7. A carrier of pigments?
8. An impregnating agent?
9. A base for pigment?
10. An oilproofing agent?
11. A flocculating agent?
12. A clarifying agent?
13. A filtering agent?
14. A stiffening agent?
15. A mordant?

This modern process agent, Swift's refined Animal Protein Colloid, has properties which may be employed in a wide number of processes. Even though you have used other processing agents, be sure you investigate Swift's Animal Protein Colloid now. It has unusual properties. It may meet the requirements of your present operations or help in developing new ones.

What is this modern process agent?

Swift's Animal Protein Colloid is made by an exclusive Swift process. Protein liquor is extracted from bones and highly concentrated. This pure liquid falls on a bed of dry finished product which adheres evenly to the droplets. Then, by continuous and automatic schedule, these droplets travel through driers and are milled and screened. This whole operation is under *precise synchronized control* and is completed in relatively short time.

The result is a uniform granular form that goes into solution rapidly. It's a purified product, light amber in color.

Because plant and machinery are kept spotlessly clean — the finished product does not touch material which can contaminate it with foreign substances . . . because of the precise control possible with Swift's exclusive process, Swift can bring you this *superior* processing agent. And Swift's Animal Protein Colloid has the same high quality and uniform characteristics the year 'round.

Swift's technical service yours, investigate now

Write or phone for one of Swift's special representatives. He will call and discuss Swift's Animal Protein Colloid with you. This process agent may be just what you are looking for. Write to:

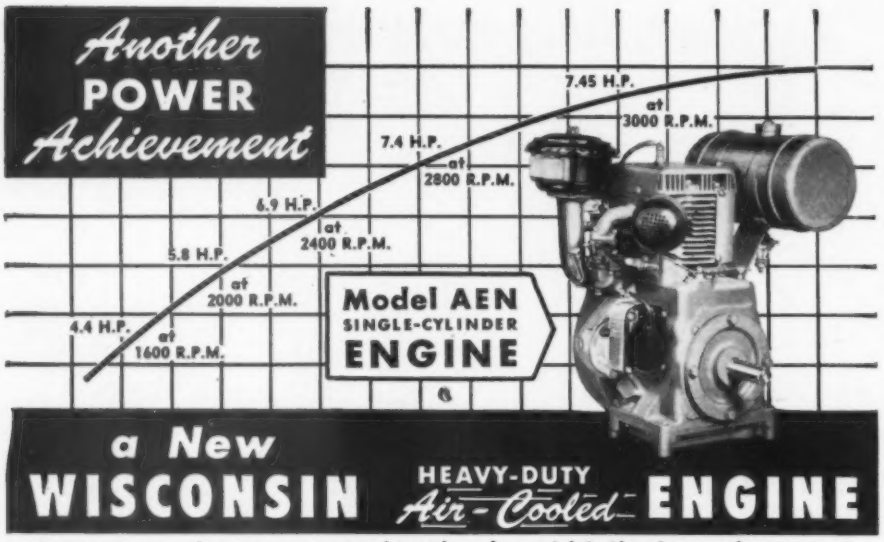
Swift & Company

ADHESIVE PRODUCTS DEPARTMENT

4119 Packers Avenue, Chicago 9, Illinois

*Commercially high quality bone glue.

Want Additional Product Information? See Page 19.



a New
WISCONSIN HEAVY-DUTY *Air-Cooled* ENGINE

Lower cost, more horsepower at normal speeds . . . less weight! Already, manufacturers and users alike are praising these features of the new heavy-duty air-cooled Model AEN 7½ hp. single-cylinder engine.

As shown, it develops peak horsepower well within normal speeds, yet weighs only 126 pounds . . . less than any comparable engine.

Advanced engineering design alone is responsible for the added power, decreased weight and lower cost per delivered horsepower. Every part is machined to traditional close tolerances. Every service-proved, heavy-duty feature still remains . . . Timken tapered roller-bearings *at both ends* of the crankshaft; jet and spray oiling, etc.

Write today for additional data. Other Wisconsin Air-Cooled Engines available in Single Cylinder, 2-Cylinder and 4-Cylinder Models, 2 to 30 hp.

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World's Largest Builders of Heavy-Duty Air-Cooled Engines
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Service is our real stock in trade!

Service is a word that's used — and abused — too often. At American it's an honest fact! We make top quality tubular and split rivets. But it's the service we have been able to render that explains why so many of the country's foremost manufacturers "buy American." We started with many of our good customers when unforeseen production loads called for more rivets, quick. We'd like to serve you.

Tubular and Split Rivets . . . of all metals . . . for all industrial applications.

Buy . . . . .
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Tubular and Split
RIVETS

AMERICAN RIVET COMPANY
(An Illinois Corporation)
1313 W. Congress St., Chicago 7, Illinois

(Continued from page 292)

and finishes of wire, and its multiplicity of uses naturally brought about in the industry a confusion in standards, specifications, tolerances, and even in the meaning of terms used to describe wire.

The American Iron and Steel Institute, through its Technical Committee on Carbon Steel Wire, has done much to bring order out of this confusion by compiling Steel Products Manual 16, Carbon Steel Wire. This Manual was first issued in 1939 and has since been revised four times. In this Manual, as far as possible, the products of the wire industry are classified, and terms defined; the manufacturing tolerances that are considered standard in the industry are presented, and specifications for various wire commodities are classified according to standard practices in the industry. This voluntary standardization, simplification, and elimination of excess varieties have brought about substantial benefits to the consumers and distributors as well as to the manufacturers.

BASIS OF PATENT GRANTS

Under the American Patent System, patents may be granted on the following, according to National Patent Council:

Any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement thereof, or any distinct and new variety of plant, other than a tuber-propagated plant, which is asexually reproduced, or any new, original and ornamental design for an article of manufacture.

Patents may not be granted on the following:

A useless device, printed matter, a method of doing business, an improvement which is the result of mere mechanical skill, a machine which will not operate, or a mere idea or suggestion.

PLASTIC TABLEWARE

Purchasing Agents interested in plastic tableware, will be interested in the following report on plasticware, which appeared in *Bureau News*, issued by the Hospital Bureau of Standards and Supplies, Inc., New York:

"Some months ago we reported on the experience at the cafeteria of Teacher's College, Columbia University, with the use of Watertown "Lifetime" Plasticware. We recently received a report for a nine-month service period from this cafeteria which serves 35,000 meals a day.

"The total initial investment for 6,588 pieces of Watertown ware was $2,909. The total breakage and loss for the nine months was 1,431 pieces, costing $706.74. The losses were broken down as follows: 530 cups replaced because of staining, 450 pieces broken, and 450 pieces stolen. The cost of the plasticware per meal served was $0.0013. This cost was checked against the records when chinaware was used and was found to be about half.

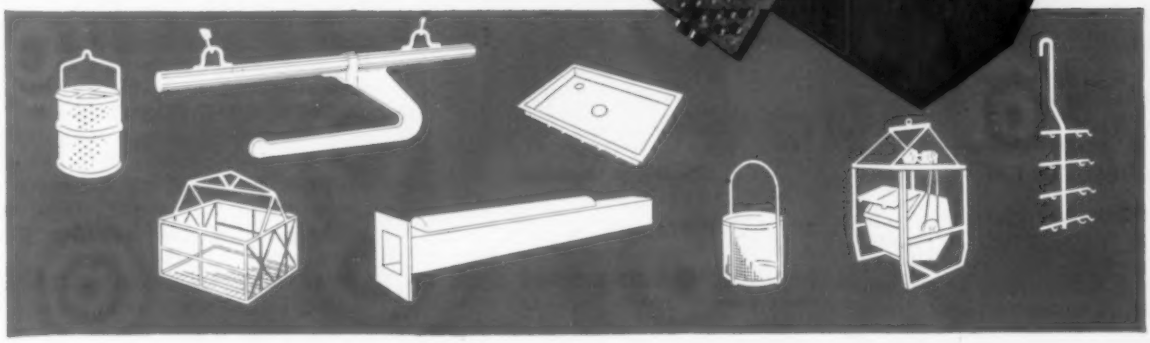
"Several Bureau members are now using the Watertown ware with excellent results."

ROLOCK

FABRICATED HEAT AND CORROSION RESISTANT ALLOYS

The chief target today for cost-cutting in metal working plants is in handling operations. Speed of movement, larger batches for each finishing operation, decreased weight of equipment, and refinement of design are of paramount importance. Rolock engineers add to these requirements a technique in the fabricating of modern alloys that is extending the service life of handling equipment to a marked degree.

We feature herewith a rugged motor-driven Rotating Pickling Barrel for better pickling of 500 to 1000 lb. loads. It was job engineered to set upon the edges of various tanks, the Monel barrel part extending down into the pickling solutions.



Hundreds of leading plants are finding competitive advantages in Rolock baskets, trays, crates, racks, fixtures, retorts, and a variety of distinctive equipment, fabricated to suit the specific job. We have solved some tough problems . . . are looking for more. You will find us easy to work with . . . experienced and helpful in reducing your handling costs. Write for interesting catalog today.

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Easier Operation, Lower Cost

2RL49

PERSONALITIES *in the* NEWS

Jack A. Collins has been appointed as Administrator of Purchases, Production Department, Sun Oil Company, at Dallas, Tex., according to an announcement by

Jack A. Collins

Ray H. Anders, Director of Purchases.

Mr. Collins will coordinate the purchasing activities of Sun's production offices in Dallas and Beaumont, Tex.; Tulsa, Okla.; Evansville, Ill. and Toledo, Ohio. His office will be in the First National Bank Building, Dallas.

Mr. Collins is a graduate of the University of Texas. He joined Sun Oil Company as a field clerk at Chacahoula, La. in 1937. He became a buyer in the Purchasing Department at Beaumont, Tex. in 1943, and three years later was appointed manager of that department.

Harold F. Kirkpatrick, Manager of Purchase of the Marsh Steel Corporation, North Kansas City, Mo., since 1946, has been elected a vice-president of the company. Mr. Kirkpatrick is president of the Purchasing Agents Association of Kansas City.

Peter J. Mooney has been named to the revived city post of Assistant Director of Supplies and Purchases in Philadelphia, Pa. Mr. Mooney will take a leave of absence from his duties as traveling and special auditor for the Pennsylvania Railroad to fill the post.

Dr. Lewis S. Reid, Assistant General Purchasing Agent, Metropolitan Life Insurance Company, New York, N. Y., was a guest speaker at a recent joint meeting of the New England section of Tappi and the New England district of the American Society for Testing Materials. His subject was "The Philosophy of Specifications".

Charles Lukens Huston recently began his 74th year of continuous service with Lukens Steel Company, Coatesville, Pa. Mr. Huston, grandson of Dr. Charles and Rebecca Lukens, for whom the company is named, is now in his 93rd year. He started with the concern in 1875 as a clerk and bookkeeper, and is today first vice-president, taking an active part in company affairs.

William R. Jarrell has been appointed State Purchasing Agent of Tennessee, at Nashville, to succeed Robert Oakley.

Charles D. Patterson has been appointed to the position of Purchasing Agent of the Chase Brass & Copper Co., Incor-

Charles D. Patterson

porated, Waterbury, Conn., succeeding Arthur G. Evans, who retired from that position after having served Chase for more than 46 years.

After a brief period of employment with the New York Edison Company following his graduation from school, Mr. Patterson entered the employ of the old U. T. Hungerford Brass and Copper Company of New York City, as an assistant to the Purchasing Agent. He retained this position from 1923 to 1927, when the Chase Brass & Copper Co. purchased the Hungerford company.

After the purchase of the Hungerford interests, Mr. Patterson became assistant to the head of the miscellaneous products department of Chase and remained in that capacity until 1942. In that year he was appointed to the position of Purchasing Agent for the former Euclid Case Plant in Cleveland, O., a war-born plant built during World War II for the government and operated by Chase. In April, 1946, Mr. Patterson returned to Waterbury to become Assistant Purchasing Agent.

Arthur G. Evans

Mr. Evans was honored by friends and associates with a testimonial dinner recently at the Chase Country Club. A former vice-president of the National Association of Purchasing Agents, he entered the service of the Chase Co. in 1902 as clerk and buyer.

Walter K. Benchley, special assistant to the chief engineer during the five-year expansion program of Hewitt-Robins Incorporated in Buffalo, N. Y., has been reappointed Purchasing Agent of the Hewitt-Rubber Division. The completion of major phases of the expansion program permitted return of Mr. Benchley to the post he previously held for 10 years.

William A. Fleischman has been appointed to the newly created position of Purchasing Agent for the company's Restfoam Division. Mr. Fleischman, who joined the company in 1922, was formerly Assistant Purchasing Agent of the Hewitt-Rubber Division.

Clinton E. Wiberg has been promoted to the position of City Purchasing Agent of Birmingham, Ala., succeeding D. H. Marbury who recently retired.

Donald N. Hale has succeeded Everet U. Irish as Purchasing Engineer for Wallace & Tiernan Company, Newark, N. J., reporting to Irene Gordon, Purchasing Agent for the company. Mr. Irish has been appointed sales engineer of the Mercehn Scale Feeder Division of the company.

(*Please turn to page* 298)

CUTTER LIFE DOUBLED

Sunoco Emulsifying Cutting Oil Solves a Many-Sided Problem for a Machine Shop — Serves Well for Both Cutting and Grinding

Milling alloy-steel barrel cams was giving a machine shop many difficulties. Cutter life was short. Finishes were poor, and marred by brown stains. The oil emulsion had to be replaced frequently because of bad odor. Grinding wheels loaded up, with the result that a grinding paste had to be used in place of the emulsifying oil.

Four years ago, on the advice of one of our engineers, the plant switched to Sunoco Emulsifying Cutting Oil. Cutter life has been doubled. The finishes are good and free of stains. The cutting fluid stays clean and pleasant in odor. In the grinding operation, it has eliminated the need for a paste—does double duty.

Many examples could be given of how "Job Proved" Sun products are speeding operations, raising quality, increasing profits. A steel mill burning out $18,000 worth of bearings a year, found the solution in a Sun high-melting-point grease. A municipal power plant, by switching to a Sun lubricant, avoided all unscheduled shutdowns of its diesels. A rubber manufacturer saved some $1,500 a month through using a Sun processing aid.

For complete information on how "Job Proved" Sun products can help you, call the nearest Sun Office.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***

In Canada: Sun Oil Company, Ltd.
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SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY

SUNOCO

Paul H. Burbage, Jr., for the past two years Purchasing Agent for Cornell-Dubilier Electric Corporation, South Plainfield, N. J., has been advanced to the post of Director of Purchases. This includes supervision of the purchasing in

Paul H. Burbage, Jr.

all Cornell-Dubilier plants—in New Bedford, Brookline, and Worcester, Mass.; Providence, R.I.; South Plainfield; and the newly established plant in Indianapolis, Ind., for the manufacture of convertors and vibrators.

A graduate of the University of Virginia, Mr. Burbage's previous connections include ten years with Western Electric and Anderson Stove Company.

Robert H. Morse, Jr., vice president in charge of all operations, Fairbanks Morse & Co., was recently elected president and treasurer of the Diesel Engine Manufacturers' Association.

Lee Muth was renamed Purchasing Agent of the Harrisburg Steel Corporation, Harrisburg, Pa., at a recent meeting of the board of directors.

Joseph A. Nagelberg has been named Purchasing Agent of the Cribben and Sexton Company, Chicago, Ill. He joined the company in 1942 as assistant super

Joseph A. Nagelberg

intendent of maintenance. He was promoted to Assistant Purchasing Agent in January, 1947 and held that position until his present appointment.

C. B. Sanders, who has been associated with the Medical College of Virginia Hospital, Richmond, Va., for 20 years as manager of the bookstore, has been named Director of Purchasing, replacing Bruce Clark.

G. H. Jackson, Vice President in Charge of Purchasing for the Modine Manufacturing Co., Racine, Wis., was recently reelected to the post.

T. W. Wright has been appointed General Purchasing Agent for Resistoflex Corporation, Belleville, N. J. Curt Stretton, for several years Director of Purchases and Secretary of the company, has resigned to become manufacturers' representative on the Pacific Coast for the screw machine parts division of the New Britain Machine Company.

R. M. Brennan, Purchasing Officer, District of Columbia, Washington, D. C., will be a member of the local advisory committee that will assist the American Hospital Association in conducting an Institute on Hospital Purchasing in Washington in April. Neal R. Johnson, Purchasing Agent for Johns Hopkins Hospital, Baltimore, Md., is chairman of the committee.

A. R. Hurr has been appointed buyer for the Houston, Tex. plant of Rohm & Haas Company.

Russell Wetherell is now western Purchasing Agent for U. S. Plywood Corporation, with headquarters in Seattle, Wash. He was formerly with Olympic Foundry Co.

W. C. Carlton is Purchasing Agent for a new fifty-ton felt mill of the Southern Felt Corporation at Morehead City, N. C., which has begun operations.

C. Sprong has been appointed General Manager of the City Utilities of Springfield, Mo. having been promoted from the position of Assistant General Manager and Purchasing Agent. Mr. Sprong has been in the utility field since 1916.

E. W. Belt, formerly General Storekeeper, has been appointed to the position of Assistant Purchasing Agent and General Storekeeper.

John F. Ditzell, president of the Janette Manufacturing Company, Chicago, Ill is handling policy matters regarding the company's procurement, following the recent death of Sidney G. Hawley who had served as Director of Purchases for the past twenty years. Clarence L. Mauthe is serving as Acting Purchasing Agent.

Irene Greene, Director of Purchases at Production Screw & Nut Co., Chicago, Ill., became president of the company in December. Miss Greene will retain direct supervision of all purchases.

James Wilson, Jr., superintendent of the Purchasing Department of the Mutual Life Insurance Company, New York, N. Y., has been promoted to assistant secretary of the company. He will continue to supervise all purchases in addition to his new duties.

Harold M. Zimmerman has been appointed Purchasing Agent of the RCA Engineering Products Department, Camden, N. J. Mr. Zimmerman jointed the RCA Victor Division last March as manager of the Sub-Contract Department of the Purchasing Division. Previously he was Purchasing Agent for the Connecticut Telephone and Electric Company, of Meriden, Conn.

Harry O. Donnohue has been appointed General Purchasing Agent of the A. B. Chance Company, Centralia, Mo. Mr. Donnohue joined the company's engineering department in 1940 and in 1948 transferred to the sales division.

Harry O. Donnohue

H. G. Cox, buyer of raw materials, and R. P. Greenlee, buyer of equipment and supplies, will continue in these capacities, reporting to Mr. Donnohue.

Reavis T. Crawford has been appointed Purchasing Agent for Baron Steel Company, Toledo, O. He was formerly with the R. G. LeTourneau Company in Vicksburg, Miss.

J. A. Grundy has been appointed materials manager of Reed Roller Bit Company, Houston, Tex. He was at one time purchasing agent of the Reed Transmission Division. Roy Stockton, steel buyer in the purchasing department, has been named assistant production manager to assist Mr. Grundy.

Jack Harding, Assistant Purchasing Agent at the University of Washington, Seattle, Wash. has been named Purchasing Agent to succeed Max Hipkoe, who has retired after 45 years with the university, thirty-nine of them spent as Purchasing Agent.

Jack Harding, left, and Max Hipkoe

In the early days of his association with the university, Mr. Hipkoe was a jack-of-all-trades, working as bookkeeper, accountant, clerk and cashier until appointed Purchasing Agent in 1910. During 1929-30 he was president of the Purchasing Agents Association of Washington.

Mr. Harding graduated from Whitman College in 1940. He has been Assistant Purchasing Agent for the university since 1941, except for four years in the navy.

(*Please turn to page* 302)

YOU CAN BE **SURE**...IF IT'S

Westinghouse

You Can Be Sure... that Westinghouse Lamps are of the highest quality

You Can Be Sure... that you can buy Westinghouse Lamps everywhere, and get them promptly

And You'll Never Do Business With Nicer People

Every distributor of Westinghouse Lamps is carefully selected; and every last one of 'em sees to it that customer service comes first. That's why we're so proud of them. See if you don't agree. Call your distributor. Or write: Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J.

Westinghouse Lamps

THE NAME YOU KNOW IN

Routine Recommendation Scores a Double-Barreled Result

• As manufactured by one of America's oldest small arms producers, these rifle and shotgun parts represent precision machining of the highest degree. Until recently, they were made of a costly non-standard grade alloy steel.

On the recommendation of a Republic Field Metallurgist, the manufacturer switched to a modified version of a standard alloy steel. The double-barrelled result: (1) Material costs were reduced. (2) Increased machinability of the standard alloy resulted in substantially greater production and much longer tool life.

Perhaps you, too, have a problem involving alloy steel. Republic—world's largest producer of alloy and stainless steels—offers this same field metallurgical service to you, without cost or obligation. Write *today*.

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Export Department: Chrysler Bldg., New York 17, N. Y.

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ALLOY STEELS

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CAN HANDCUFF YOUR PRODUCTION!

Safeguard All Hands with **WEST LAN-O-KLEEN HAND CLEANSER**

The shackles of industrial dermatitis can handcuff your workers' manual efficiency—tie up your production schedules—cripple plant morale—and cut sharply into your profits.

One way to remove these costly shackles is to avoid *unsafe* wash-up soaps. Instead, use WEST LAN-O-KLEEN—the mild, safe, quick-acting powdered soap that helps *protect* hands against the effects of industrial irritants. Dispensed through an economical, modern dispenser, WEST LAN-O-KLEEN contains no harsh ingredients or excess alkali to harm sensitive skins. Also, it is prepared of a gentle corn meal base which is "lanolinized"—thus helping to offset loss of natural skin oils.

TRY LAN-O-KLEEN FREE—and SEE!

Fill out the coupon below! It'll bring you a sample of industry-proved WEST LAN-O-KLEEN without obligation. Along with this you'll receive a fact-packed booklet. It'll explain how WEST LAN-O-KLEEN and the modern LAN-O-KLEEN DISPENSER can cut your costs considerably.

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Gentlemen:
Please send me a free sample carton of LAN-O-KLEEN.

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Company_____

Address_____

City_____ State_____

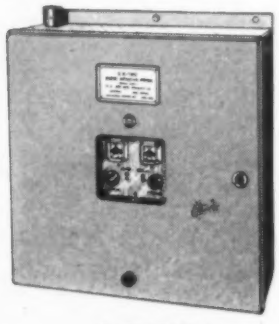
15

Teach fire prevention of course ...but be sure you have modern fire protection by

All the training, all the good housekeeping requirements are necessary. Even then . . . a stray spark or short circuit just seems to happen . . . a fire starts. That's when you need modern, quick-acting C-O-TWO fire protection. C-O-TWO is dry, clean carbon dioxide gas . . . snuffs out the fire in seconds, then disappears without a trace. It is non-contaminating, non-damaging, non-conducting and non-corrosive.

There are areas in your plant that particularly need C-O-TWO fire protection: spray booths, dip tanks, solvent baths, electrical equipment enclosures, lift trucks, pump rooms, anywhere there's danger of flammable liquid or electrical fires. For complete fire protection in enclosed areas such as record vaults and store rooms, install the new C-O-TWO Combination Smoke Detecting and Fire Extinguishing System. This new system is a 24 hour a day automatic watchman.

Let an expert C-O-TWO Fire Protection Engineer advise you on your fire protection needs now, before fire strikes. Just clip this advertisement to your letterhead or calling card and mail for complete information about modern C-O-TWO Fire Protection Equipment. Remember fire doesn't wait . . . act now!



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Sales and Service in the Principal Cities of United States and Canada
AFFILIATED WITH PYRENE MANUFACTURING COMPANY

RAYMOND WILSON COOK

Raymond Wilson Cook, 58, executive vice-president of the Associated Spring Corporation, Bristol, Conn., died recently in the Hartford Hospital. Mr. Cook joined the Wallace Barnes Company Division of Bristol, Conn. at an early age and during forty years of service worked in many capacities. At one time he was purchasing agent and in charge of advertising; later he entered the production end of the business to rise from department superintendent to factory manager of the Bristol Divisions.

AMONG THE COMPANIES YOU BUY FROM

Albuquerque, N. M.—Hewitt Rubber Division, Hewitt-Robins Inc. Industrial Supply Company, 1647 North Second Street, has been named distributor in the New Mexico area.

Philadelphia, Pa.—The Electric Storage Battery Company. Robert L. Sommerville has been appointed Exide's assistant

Robert L. Sommerville

general sales manager. He was formerly manager of automotive sales. Mr. Sommerville has been with the company for 30 years.

Houston, Tex.—General Switch Corporation. Glidden Engineering and Equipment Company has been named sales agent for Texas and Oklahoma.

Pittsburgh, Pa.—Bowser, Inc. L. J. Suelzer has been appointed manager of the newly created district office at 502 Oliver Building.

New York, N. Y.—The Dow Chemical Company. Leo B. Grant has been named manager of the company's sales office here to succeed the late Ralph E. Dorland.

Dayton, O.—Graybar Electric Company, Inc. A. J. Fischer has assumed the duties of manager of the company's branch here. He joined Graybar 21 years ago.

Cincinnati, O.—McQuay, Inc. Sales territory of Ted Stikeleather, who represents the company on refrigeration products, has been increased to include western New York, western Pennsylvania, all of Ohio, West Virginia and Kentucky, and the major portion of Indiana.

(*Please turn to page* 304)

slashes finishing costs • improves your products

Now you can get on the "bright" side, right from the start. With the exclusive new CMP bright annealed stainless THINSTEEL you can enjoy the advantages of lower finishing and fabricating costs — and the plus of increased sales appeal through improved finish and corrosion resistance.

Produced in many chrome-nickel types and in gauges thin as .001, this new THINSTEEL product broadens your opportunity for product betterment with competitive costs in mind. Would you like a sample and more information? Write today.

CMP Registered THINSTEEL

CMP STRIP STEEL — PRECISION COLD ROLLED

the Cold Metal Products co.

YOUNGSTOWN 1, OHIO

NEW YORK • CHICAGO • DETROIT • ST. LOUIS • INDIANAPOLIS • LOS ANGELES

Want Additional Product Information? See Page 19.

"What's so good about H-VW-M mercil type PLATING BARRELS?"

GEORGE G. KNECHT
District Manager
H-VW-M Connecticut Office

"I like this frequently asked question. It gives us a chance to stress the economies of H-VW-M plating barrels. Our new Merlon cylinder, for instance, withstands high acid and alkali concentration and high temperature, permits loading plating cylinder and processing it directly through entire cleaning and plating cycle, eliminates the usual transfer of work load from cleaning baskets or monel cylinder to plating cylinder. Results are high speed production . . . low handling cost.

"We also discuss our various types of cathode contacts which meet any kind of load condition . . . our unobstructed cylinder for bulky pieces . . . our contact to stir up dense work loads . . . all adds up to high current efficiency. Then we point out H-VW-M's practical development for the constant replacement of plating solution in the cylinder, which means constant solution balance, consequently lower solution maintenance cost and a more uniform deposit.

"Our Plating Barrel Bulletin PB-107 covers this subject specifically. Write for your copy . . . and if you wish we'll be glad to discuss your problems personally at any time."

Hanson-Van Winkle-Munning has supplied the plating industry for over 70 years. Our sales-engineers are thoroughly familiar with every step in the process of electroplating and polishing. It is this *overall* knowledge that has made H-VW-M "Headquarters" for electroplating and polishing equipment, supplies and technical assistance.

HANSON-VAN WINKLE-MUNNING COMPANY
MATAWAN, NEW JERSEY
Manufacturers of a complete line of electroplating and polishing equipment and supplies
Plants: Matawan, New Jersey • Anderson, Indiana
Sales Offices: Anderson • Chicago • Cleveland • Dayton • Detroit
Grand Rapids • Matawan • Milwaukee • New Haven • New York • Philadelphia
Pittsburgh • Rochester • Springfield (Mass.) • Stratford (Conn.) • Utica

STAINLESS STEEL SCREWS

IMMEDIATELY!

When your Production or Development Departments need Stainless Screws — depend on ALLMETAL. Immediate shipment from large and complete stock of Machine, Self-tapping, Socket, Wood Screws, etc.

PROMPT DELIVERY Recessed Head Screws and Special Runs in large and small quantities.

SEND ON YOUR LETTERHEAD FOR CATALOG No. 49G.

STAINLESS STEEL FASTENERS

MANUFACTURERS SINCE 1929
ALLMETAL
Screw Products Co., Inc.
33 GREENE STREET, NEW YORK 13, N. Y.

Cleveland, O.—Tennessee Eastman Corporation. D. B. Campbell, Jr. has opened an office in the Terminal Tower Building where he will act as sales representative for the company's chemicals for the Ohio area.

Memphis, Tenn.—Bemis Bro. Bag Co. W. F. Powell has been appointed assistant sales manager at the company's plant here. He has been with Bemis for the past 29 years.

Newark, N. J.—Hydraulic Equipment Company. A sales office has been established at 1060 Broad Street, under the supervision of Richard Andrews, eastern sales engineer.

Pittsburgh, Pa.—Lewis Foundry & Machine Division, Blaw-Knox Company. James M. Lewis has been named manager of roll sales for the division.

Chicago, Ill.—Gedney Electric Company. Russell L. Jessee has been appointed central states sales manager.

Cleveland, O.—The Lamson & Sessions Co. H. C. "Doc" Goodrich has been promoted to district sales manager for the company, in charge of Ohio, West Virginia, eastern Kentucky and part of eastern Indiana. William T. Olsen is assisting Mr. Goodrich in handling this territory. Mr. Goodrich has been with Lamson since 1937.

H. C. Goodrich

Philadelphia, Pa.—Joseph T. Ryerson & Son, Inc. W. A. Redpath has been appointed manager of the company's plant here, to succeed C. L. Hardy, who was recently elected assistant vice-president of the Ryerson organization, with headquarters in Chicago.

Rochester, N. Y.—American Brake Shoe Company. Philip H. Clapp, Jr., formerly sales representative, has been appointed sales manager of the engineered castings division of the company.

Mt. Pleasant, Mich.—The National Supply Company. George H. Shumaker has been appointed district manager of the Michigan district.

New York, N. Y.—Berger Manufacturing Division, Republic Steel Corp. Charles D. Eichorn has been appointed sales representative.

Cleveland, O.—Kennametal, Inc. Robert Hutchinson has been appointed application engineer in the central district, with offices at 860 Hanna Bldg.

(*Please turn to page* 306)

SIMONDS
ABRASIVE CO.
PHILADELPHIA, PA.

Grinding Wheels

How fast is fast?

With Simonds Abrasive Wheels the answer is not merely in revolutions per minute . . . but in maximum efficiency per revolution . . . top production per operation . . . greater economy per wheel dollar . . . longer service per wheel.

The answer also lies in selective scope and availability—and Simonds Abrasive offers you both—a line of grinding wheels in every desired combination of grain, grade and size, plus a distributor service constantly geared to your requirements.

Let's send you the name of your nearby distributor and a copy of our Data Book describing Simonds Abrasive Company's complete line.

SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA. DISTRIBUTORS IN PRINCIPAL CITIES

Want Additional Product Information? See Page 19.

about SPRINGS?

Illinois Coil Spring Company, Chicago, makes them right—and at reasonable cost. Regarded by an ever increasing number of manufacturers as the ideal source for high grade mechanical springs, all types and sizes—also clips, small stampings and wire forms. We'll design them for you or make them exactly to your specifications. Plant is large enough to handle big orders smoothly, compact enough to give prompt service on small orders and experimental work. Our steady growth is evidence that policy, price and production are RIGHT So why not call us in on that spring job?

Sent On Request!

Interesting new bulletin "BRIEF GUIDE for SPRING BUYERS," tells in plain language what a good spring is and how to get it without excessive cost.

(P)

MR. _____

FIRM _____

STREET _____

CITY _____

(Mail to 2100 N. Major Ave., Chicago 39, Ill.)

Painesville, O.—Diamond Alkali Company. C. S. Hancock, on the sales staff of the company's pure calcium products division since 1936, has been promoted to manager of calcium carbonate sales.

Brea, Calif.—Chiksan Company. G. R. Winder has been appointed vice-president and sales manager.

Toledo, O.—Kimble Glass, division of Owens-Illinois Glass Company. E. B. Dennis, Jr. has been named general sales manager.

Hamilton, O.—Lima-Hamilton Corporation. Eugene C. Schum has been appointed diesel engine sales manager of the Hamilton Division of the company.

New York, N. Y.—Continental Can Company, Inc. R. L. Perin, formerly central division sales manager of the company, has been named general sales manager.

Dayton, O.—The Dayton Rubber Company. Claude M. Lamb has been appointed to the new position of sales manager,

C. M. Lamb

industrial V-belt division, and assistant to vice-president in charge of mechanical sales. R. S. Grove succeeds Mr. Lamb as New York district sales manager.

Detroit, Mich.—Inland Steel Company. Warren H. Williams is now district sales manager for the company here, succeeding John Henry Fitch, who recently retired after 15 years' service. Harris S. Currier has been named assistant district sales manager.

Indianapolis, Ind.—Cutler-Hammer, Inc. The company has moved its Indianapolis sales office to new quarters at 644 E. Maple Road. F. W. Gilchrist manages the office.

Los Angeles, Calif.—Lindberg Engineering Company. A new west coast office has been established here at 5531 Vermont Street. Stuart K. Oliver has been named manager.

Seattle, Wash. — Raybestos-Manhattan, Inc. A new warehouse and office for service to the Pacific Northwest has been opened at 314 Occidental Avenue. A complete stock of industrial rubber products will be carried.

San Francisco, Calif.—Marcus Transformer Company, Inc. E. B. Cook Company, 1063 Howard Street, has been appointed territorial representative for northern California.

(*Please turn to page* 308)

"LET'S LOOK FOR TROUBLE"

Says CHIP WRIGHT

"Looking for trouble is a necessary part of efficient operation, because the most efficient shop is one in which troubles are reduced to a minimum.

"A plant honing cylinder blocks was considered to be trouble-free when it was averaging 9.6 blocks per stone and getting a fair finish. However, when a change of honing oil made it possible to hone 15.4 blocks per stone and get a better finish, it was realized that there actually had been *trouble* before this profitable change was made.*

"That's what I mean when I say, 'Let's look for trouble.' Another way of stating it is: 'Where can we find opportunity for improvement?' Frequently the biggest single opportunity lies in the choice of cutting fluids."

—Chip

*The change that improved the honing operation cited above was a mixture of ThredKut 99 recommended by a D. A. Stuart Oil Co. representative. ThredKut 99 is easily mixed or blended whenever a special operation calls for its unusual qualities. Ask for a booklet on D. A. Stuart's ThredKut 99 and other time-tested cutting fluids.

STUART *oil engineering goes with every barrel*

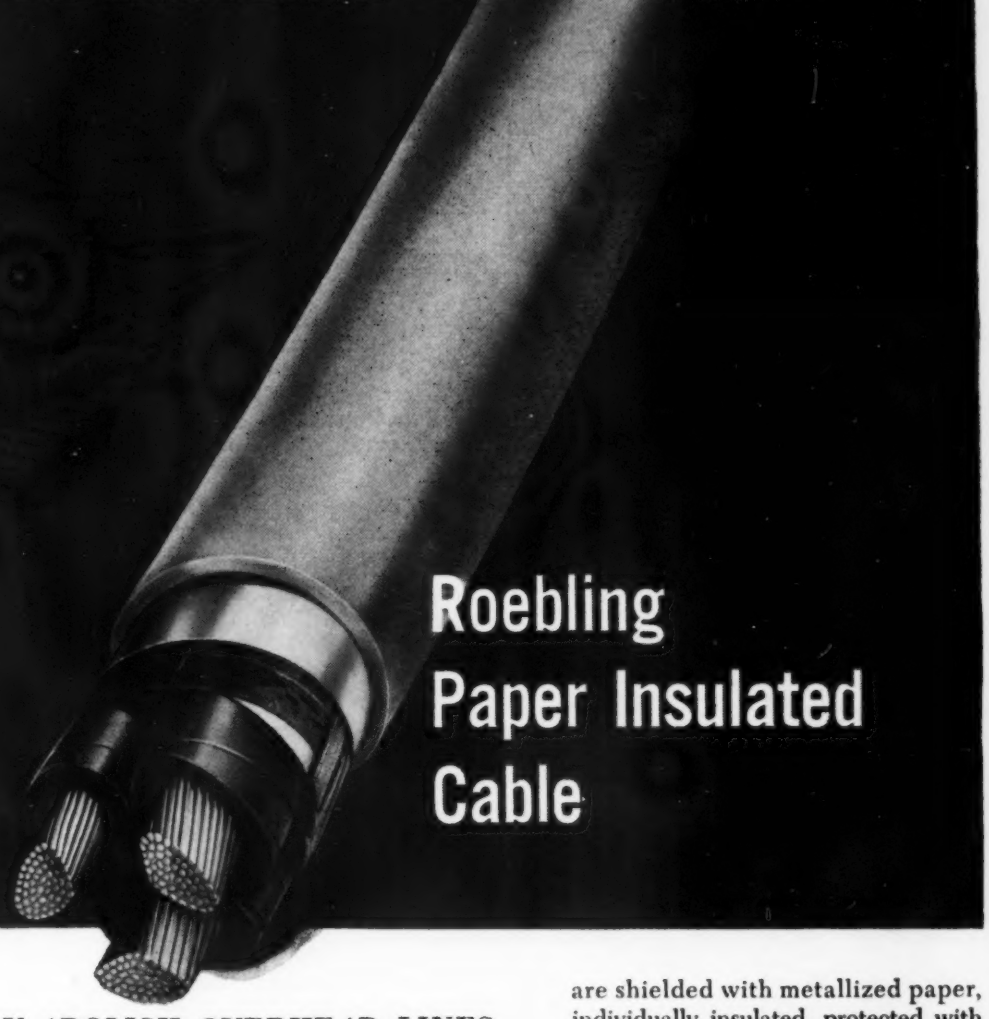
D. A. Stuart Oil Co.

2727-31 S. TROY ST., CHICAGO 23, ILLINOIS

JR ROEBLING

SAVE...

WITH UNDERGROUND INSTALLATION



Roebling Paper Insulated Cable

YOU WIN WHEN YOU ABOLISH OVERHEAD LINES

YOU'VE EVERYTHING TO GAIN and nothing to lose (except costly maintenance and eyesores) when you abolish overhead lines. Today's best practice is to put circuits underground . . . and to install Roebling Paper Insulated Lead Encased Cables for long, uninterrupted service at lowest cost.

Roebling Shielded Type H is outstanding for 3-phase grounded neutral circuits from 13 to 33 kv. It comes in both single and multiple conductor construction, in regular and Compack strand (round or sector). Conductors are shielded with metallized paper, individually insulated, protected with perforated copper shielding tape, and then the whole assembly served with a bronze binder tape and lead sheathed.

Your nearest Roebling office and sales engineer will be glad to help you choose the *right* cable for your specific service. John A. Roebling's Sons Company, Trenton 2, New Jersey.

WRITE OR CALL THE ROEBLING FIELD MAN AT YOUR NEAREST ROEBLING OFFICE AND WAREHOUSE

Atlanta, 934 Avon Ave. ★ *Boston*, 51 Sleeper St. ★ *Chicago*, 5525 W. Roosevelt Rd. ★ *Cleveland*, 701 St. Clair Ave., N. E. ★ *Denver*, 1635 17th St. ★ *Houston*, 6216 Navigation Blvd. ★ *Los Angeles*, 216 S. Alameda St. ★ *New York*, 19 Rector St. ★ *Philadelphia*, 12 S. 12th St. ★ *Pittsburgh*, 855 W. North Ave. ★ *Portland, Ore.*, 1032 N. W. 14th Ave. ★ *San Francisco*, 1740 17th St. ★ *Seattle*, 900 First Ave.

ROEBLING

☆ A CENTURY OF CONFIDENCE ☆

GRAY IRON
CASTINGS

S. A. E. OR A. S. T. M.
CLASSES 20—30—40

2 FOUNDRIES
on 2 main line railroads

equipped for fast, efficient production to meet your casting requirements.
Special facilities for rollover and cope-and-drag production to 150 pounds.
Other castings up to 1000 pounds.
Send us your inquiries or ask for a representative to call to discuss your casting requirements.

Compressor Unit

Intake Manifold with Heater Body

TYPICAL FOREST CITY CASTINGS
(unretouched photos)

Gas Meter Valve Plate

THE FOREST CITY FOUNDRIES COMPANY
2300 WEST 27TH STREET
CLEVELAND 13, OHIO
Phone PRospect 5040

Detroit, Mich.—Carboloy Company, Inc. Harry Crump, for the past year manger of cutting tool sales engineering, has been named assistant to the sales manager.

Chicago, Ill.—Industrial Process Engineers. A. J. Foley and A. J. Foley Co. have been named Chicago territory representatives, with offices at 7309 East End Avenue.

Minneapolis, Minn.—Bemis Bro. Bag Co. John T. Braxtan has been named office manager at the company's plant here. He was formerly with the company's general offices in St. Louis as supervisor of burlap sales.

New York, N. Y.—Jessop Steel Company. Jonathan D. Freeze has been appointed district sales manager for the New York territory. His offices are at 30 Church St.

Houston, Tex.—Wheelco Instruments Company. A new district office has been opened at 2204 Fannin St., under the direction of George Hatfield.

Indianapolis, Ind.—Landis Tool Company. A direct sales and service office has been opened at 709 East 38th Street. The territory will include all of Indiana south of Indianapolis and north as far as Logansport, Huntington and Fort Wayne.

Philadelphia, Pa.—The Electric Storage Battery Company. Wm. Van C. Brandt has been named manager of the Exide railway and motive power sales division, recently consolidated.

Montreal, Que., Can.—Acme Steel Company of Canada Ltd. General offices have been moved to new and larger quarters at 660 Cather St., West.

Los Angeles, Calif.—Cerro de Pasco Copper Corp. Peck Steel and Die Supply, 4436 Long Beach Avenue, has been named West Coast distributor of Cerro low-temperature-melting alloys.

Detroit, Mich. — Raybestos-Manhattan, Inc. J. V. Bassett, chief sales engineer-heavy duty friction material division, has been transferred to the equipment sales division in the Fisher Building here.

Chicago, Ill.—Fred H. Schaub Engineering Co., Inc. Frank T. Settle has been appointed field sales engineer for all the company's products and equipment.

Chicago, Ill.—Watson-Stillman Company. Richard W. Schreck has been named Michigan divisional sales representative. He will work out of the company's Chicago office.

New York, N. Y.—Pennsylvania Flexible Metallic Tubing Co. Lionel Tinon has been added to the staff of industrial sales engineers here.

Ridgewood, N. J.—Continental Industrial Engineers, Inc. R. W. Richards Company has been named eastern representative.

Philadelphia, Pa.—Kurz-Kasch, Inc. E. J. Edmunds has been appointed district sales engineer in the Philadelphia and Baltimore areas. Mr. Edmunds, who taught a course on plastics at Purdue University during the war, was for 12 years with the RCA-Victor division, Radio Corp. of America, in a plastics engineering and purchasing capacity.

Chicago, Ill.—American Flexible Coupling Company. Ehret & Kinsey, 327 So. LaSalle, have been appointed sales engineers for the company.

St. Louis, Mo.—Baker Industrial Truck Division, Baker-Raulang Company. Fred R. Ramsen, 2120 South Seventh Street, has been appointed district sales representative in southern Illinois and eastern Missouri.

Toronto, Ont. Can.—Hydro-Line Manufacturing Co. C. M. Murray Limited has been appointed representative of the company.

Needham, Mas.—Threadwell Tap & Die Company. Roger Hubbell has been appointed district sales engineer for the company, and will cover the New England territory.

Roger Hubbell

Pittsburgh, Pa.—Follansbee Steel Corporation. Robert K. Follansbee has been elected vice-president in charge of sales.

Atlanta, Ga.—Chain Belt Company. A new warehouse has been established at 878 Ashby Street, NW, under the direction of J. S. Moore, district manager.

Philadelphia, Pa.—Marcus Transformer Company, Inc. Lew C. Conover, 100-A South 21st Street, has been appointed representative for eastern Pennsylvania, Delaware, Maryland, Washington, D. C., and southern New Jersey.

St. Louis, Mo.—Caine Steel Company. John C. Groffel has been appointed district manager of the St. Louis territory.

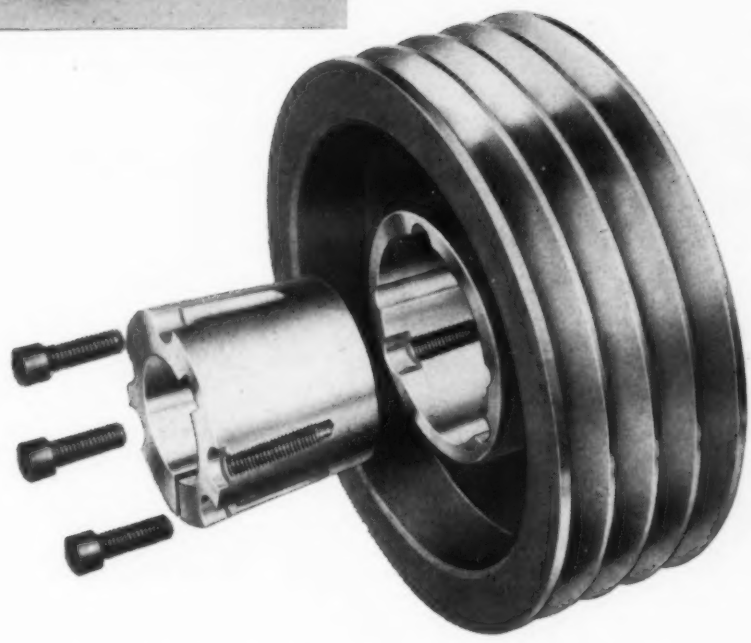
Chattanooga, Tenn.—Mathieson Chemical Corp. Henry Gifford has joined the heavy chemical sales division of the company, and will cover Tennessee and adjoining states.

Bristol, Conn.—New Departure Division, General Motors Corp. Ralph O. Wirtemburg moves from the position of eastern regional sales manager to that of special assignments originating from the general sales manager's office. James P. Gillilan, manager of the department's New York zone office, succeeds Mr. Wirtemburg as eastern regional manager.

(*Please turn to page* 310)

The simplest, surest mechanism ever devised for holding wheels to shafts

Holds fast to the shaft with firmness equivalent to a shrunk-on fit



No flange — no collar. Easy on, easy off. Slip it on and tighten while sighting

Stocked in complete range of sizes in Dual Duty (A and B); B, C and D grooves

A Great, Time-Saving Development—

TAPER-LOCK

Trade Mark

V-BELT SHEAVE

This is one of the century's biggest developments in power transmission equipment—another Dodge "first." Simpler, tighter-fitting, truer-running, infinitely easier to handle. Saves installation time and results in neater applications—in the plant or on your product.

Dodge's sole business is to "get the power through"—smoothly, steadily, economically. To succeed in this business Dodge has developed *many* products that are outstanding in the field of mechanical power transmission. Your Transmissioneer, the local Dodge Distributor, is equipped to give you valuable information on new and better ways to transmit power.

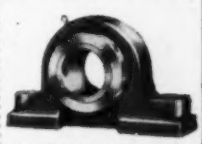
DODGE MANUFACTURING CORPORATION, MISHAWAKA, IND.

OTHER DODGE "FIRSTS"

Dodge-Timken Bearing. 4 basic types in a vast range of sizes.

Taper-Lock Flexible Coupling. Ready to install without reboring.

Rolling Grip Clutch. No toggles! Flexible. Positive.



"SC" Ball Bearing with new Neoprene metallic-backed seals.

DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER

Look for the name of the Transmissioneer, your local Dodge distributor, under "Power Transmission Equipment" in your classified telephone directory.

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

LUNKENHEIMER VALVES Meet High Standards in Abbott Laboratories

Lunkenheimer Valves in the process lines at the fermenters used in the production of penicillin and streptomycin.

NOTED PHARMACEUTICAL MANUFACTURER SPECIFIES LUNKENHEIMER VALVES for process lines in its modern North Chicago Plant

IN the manufacture of the wonder drugs, penicillin and streptomycin, it's small wonder that Lunkenheimer Valves are included with other items of the finest-obtainable processing equipment. Intermediate compounds in the ratio of approximately five thousand units to one of finished product are flow-controlled by hundreds of Lunkenheimer Valves.

For dependability over long periods of service, these valves at Abbott Laboratories illustrate the way all phases of industry and commerce rely on Lunkenheimer Valves. This same low-cost service can be a profit factor in your operations.

WHETHER YOU'RE PLANNING a new plant, expansion of present facilities or modernization . . . you can specify Lunkenheimer Valves with utmost confidence. Available through Distributors in all industrial centers.

ESTABLISHED 1862

THE LUNKENHEIMER CO.

"QUALITY"

CINCINNATI 14, OHIO, U. S. A.

NEW YORK 13 CHICAGO 6

BOSTON 10 PHILADELPHIA 34

EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.

McKeesport, Pa.—A. B. Murray Co., Inc. Three new salesmen, Richard H. Lamont, Charles C. Northrup and Collins Boyce, have been assigned to the eastern Ohio, Pittsburgh and Buffalo-Erie areas.

Dayton, O.—Leland Electric Company. P. J. Ganley has been appointed vice-president in charge of sales.

Schenectady, N. Y.—General Electric Company. W. V. O'Brien has been named general sales manager of the company's apparatus department.

New York, N. Y.—Bauer & Black, Division of The Kendall Company. Herbert A. Post, Inc. has been named distributor for the company's industrial adhesive tapes.

Philadelphia, Pa.—Interstate Steel Company. A new office has been established at 6701 North Broad Street, headed by Saul Bradburd.

Fair Haven, Mich.—Pennsylvania Refining Company. Frank D. Messenger has been appointed manufacturer's representative for Penn Drake products in the lower Michigan peninsula.

Pittsburgh, Pa.—Hauser Machine Tool Corp. McBeth Machinery Co., 1109 Grant Building, has been appointed representative in the Pennsylvania, West Virginia and Ohio territory.

Cincinnati, O.—The Monarch Machine Tool Company. A sales office has been established here in the Roselawn Center Building with Frank Heap in charge of the expanded sales territory.

Chicago, Ill.—Jessop Steel Company. E. E. Bradberry has been appointed assistant manager of sales in this city, with offices at 332 South Michigan Avenue.

Roselle, N. J.—Watson-Stillman Company. J. T. Gillespie has been named general sales manager.

Chicago, Ill.—United States Steel Supply Company. National headquarters of the company, warehousing subsidiary of the United States Steel Corp., have moved from 1319 Wabansia to 208 S. LaSalle St. The warehousing plant and Chicago district operation sales will continue at the old location.

Chicago, Ill.—Sterling Tool Products Company. D. A. Hutchison has been appointed general sales manager.

St. Louis, Mo.—General Controls. B. L. Lerch has been named factory branch manager of the new St. Louis office.

Oklahoma City, Okla.—General Controls. O. D. Shaddox has been appointed factory branch manager of the new office recently established here.

Chicago, Ill.—Foote Bros. Gear and Machine Corporation. R. C. Brown has been named director of sales.

FAMOUS PRODUCTS GO TO MARKET IN...

GAIR CARTONS

Arrow Shirts Are Now Going to Market in a New, Improved Two Piece Folding-Box

This attractive, revolutionary box was recently designed and developed by the technical staff of Robert Gair. The new GAIRanteed features in ARROW BOXES are solving major problems of shipping, warehousing and "set-ups" . . . furthermore these innovations are providing worthwhile economies.

What GAIR accomplished with this outstanding achievement for Cluett, Peabody & Company is typical of the technical and efficient service that the ROBERT GAIR ORGANIZATION has been rendering for more than eighty years.

GAIR technical staff will be glad to hear about your packaging problems. Write today.

ROBERT GAIR COMPANY, INCORPORATED
NEW YORK • TORONTO
PAPERBOARD • FOLDING CARTONS • SHIPPING CONTAINERS

Now...25% MORE WEAR

with NEOX*

Edmont's New, Tougher Coating for Liquid-Proof

WORK GLOVES

NEOX, the remarkable new coating for work gloves developed by Edmont, incorporates the long wear of plastic with the resilient qualities of Neoprene to assure at least 25% longer wear with complete flexibility and comfort. These NEOX coated gloves with the fabric lining set new standards of safety in the handling of materials wet or dry, sharp or abrasive. They fully protect against acids, caustics, oils, greases, and many solvents. Knit-wrist or gauntlet styles.

*Combination of Synthetic Rubber and Plastic

See Your Safety Equipment or Industrial Supplier

Edmont Manufacturing Co.

540 ORANGE ST. COSHOCTON, O.

( ) Please send full information and prices

COMPANY NAME.....

ADDRESS.....

CITY..... STATE.....

ATTEN. OF.....

We shall gladly make recommendations for the most economical style upon receipt of full application information.

INDUSTRIAL DEVELOPMENTS

Vanadium Corporation of America has opened an aluminum alloy plant at Eddystone, Pa. for supply to the aluminum industry and for use in the manufacture of the company's ferro-alloy products at its own plants in other locations.

General Electric Company has completed the first section of its new research laboratory in Niskayuna, N. Y. The complete laboratory, which will cost approximately $18,000,000, is expected to be ready by 1950.

Continental Can Company, Inc. will begin construction of a new plant at West Mifflin Boro, Pa. early this spring. The plant will be used for the manufacture of metal cans and crown caps.

Joseph T. Ryerson & Son, Inc., Chicago, Ill., steel distributors, announce the election of William Seymour, Jr., vice-president, C. L. Hardy, assistant vice president, and Thomas G. Miller, secretary. Mr. Hardy, as assistant vice-president, will serve as an executive in the procurement department.

William Seymour, Jr. C. L. Hardy

Permanente Metals Corporation, Permanente, Calif. has begun production on Kaiser aluminum foil. Maximum production of foil at the plant will be approximately 5,000,000 pounds per year, according to the company.

Rigidized Metals Corporation is the new name adopted by the former Rigid-Tex Corporation, 658 Ohio St., Buffalo, N. Y.

Fort Duquesne Steel Company, Pittsburgh, Pa. has purchased majority stock control of The Hamilton Steel Company, Cleveland, O.

Penn Rivet and Machine Company, Milford, Conn., formerly Penn Rivet Corporation, has changed its corporate name to the Milford Rivet & Machine Company, Penn Division.

General Electric Company's lamp department has announced the opening of a new plant at Circleville, O., for the manufacture of slimline fluorescent lamps.

Spencer Thermostat Company, Attleboro, Mass., for many years operated as a wholly owned subsidiary of Metals & Controls Corporation, will hereafter be conducted as Spencer Thermostat Division, Metals & Controls Corporation.

(*Please turn to page* 316)

Have you considered how this man can lower the cost of your springs?

THE gentleman pictured above represents Accurate's production-conscious engineers who are continually searching for ways to reduce your spring costs. Their record is an enviable one, too. Scores of manufacturers making all types of products have profited by Accurate's "know-how." We'd like to tell you about actual cases in which we have saved our customers substantial amounts. And, of course, we'd like to point out what we can do for you. Write, wire or phone, today.

Accurate Springs

A *dependable* source of supply!

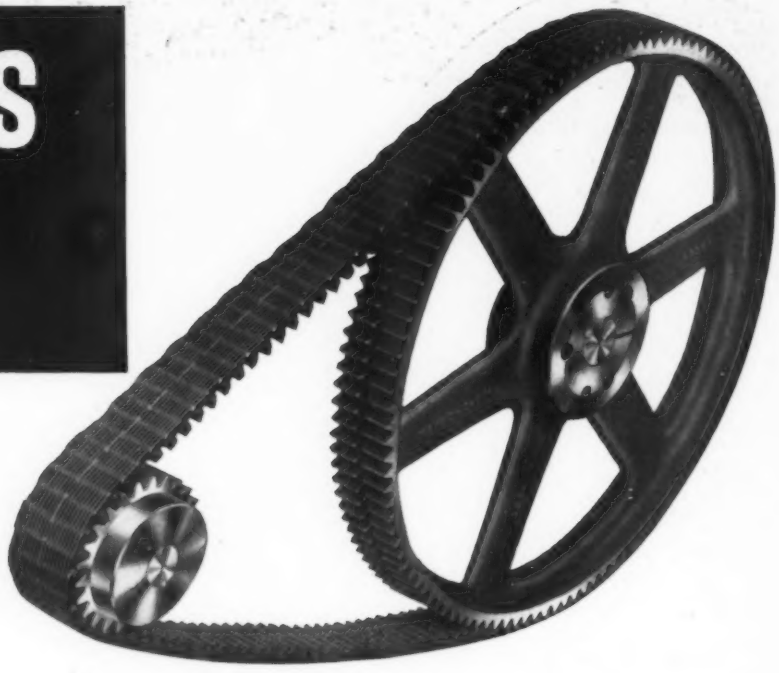
ACCURATE SPRING MFG. CO.

3825 W. Lake St. • Chicago 24, Ill.

Springs, Wire Forms, Stampings

bend it...
twist it...
stamp it...
spin it...
Use any standard fabricating method you wish!
The bond is inseparable!
SuVeneer Clad Metal's solid copper, monel or nickel cladding is bonded to low-carbon strip steel for keeps! It cannot be separated by mechanical means—you can use full freedom in new product design and count on dependable fabrication results. Get the special benefits of these solid metals combined with a strip steel base—specify and use SuVeneer Clad Metal!
SuVeneer®
CLAD METAL
Copper Clad
Monel Clad
Nickel Clad
Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

ENDLESS STORY

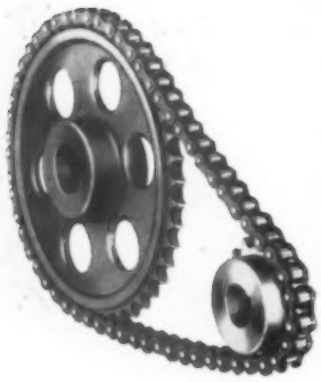


Morse Silent Chain Drives

THE STORY of Morse Silent Chain Drives is an endless one of efficiency, low cost and positive power transmission.

Perhaps the most effective known means of transmitting power between shafts, Morse Silent Chain is quiet, smooth, and dependable. Considered by engineers as flexible gearing, it has been used to transmit 5000 h.p. in a single drive; speeds have sometimes exceeded 8000 FPM. At high velocities, Morse Silent Chain Drives utilize centrifugal force to distribute driving effort over a greater number of teeth, reducing impact, wear, and noise.

Part of the story of the operating economy and long life of Morse Silent Chain Drives is found in the famous frictionless rocker joint. Employing essentially a simple rocking-chair action, Morse Silent Chain contact is confined to rolling instead of sliding action. Less heat is developed, enabling the drive to transmit heavy loads at high speeds without overheating.



Simple to connect or disconnect, Morse Silent Chains can be installed or removed without dismantling machines on which they are used. Chain length is easily and quickly adjusted for any center distance, and speed ratio changes can be readily accomplished. The initial cost of Morse Silent Chain Drives is surprisingly low, and their high efficiency and frictionless joint design assures the lowest operating cost per hour and low maintenance outlay.

Why not check the Morse Silent Chain story more completely? Write for catalog C71-48. Morse Chain Company, Dept. 299, Detroit 8, Michigan.

★ ★ ★

Morse Roller Chain Drives • A low-cost, positive, efficient, flexible drive for use under rigorous operating conditions. Morse Standard Roller Chain is applicable to a wide range of installations and is available in all American Standard pitches and widths.

Morflex Couplings

Roller Chain Couplings

Silent Chain Drives

MORSE

MECHANICAL POWER TRANSMISSION PRODUCTS

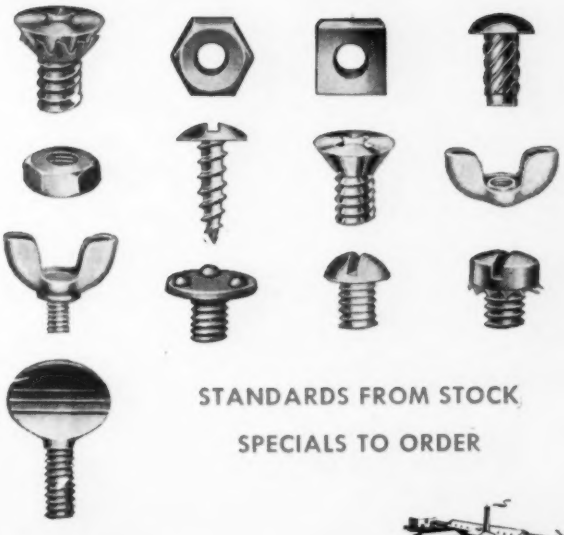
A PRODUCT OF B-W BORG-WARNER

Morflex Radial Couplings

MORSE CHAIN COMPANY • DETROIT 8, MICHIGAN

Want Additional Product Information? See Page 19.

From the tiny truss head screws in your electric toaster, to the larger stove bolts in cooking ranges—Central Screw Company is one of the nation's leading producers both quantity-wise and quality-wise. **TWO HIGH-SPEED PLANTS**, one east and one midwest, enable Central to deliver all types of standard and special fasteners to any destination . . . *fast!*



Fast DELIVERIES...

FROM CENTRAL'S **2** BIG PLANTS

STANDARDS FROM STOCK

SPECIALS TO ORDER

A TWO-PLANT ORGANIZATION FOR QUICK NATION-WIDE SERVICE

"You Can Depend on Central"

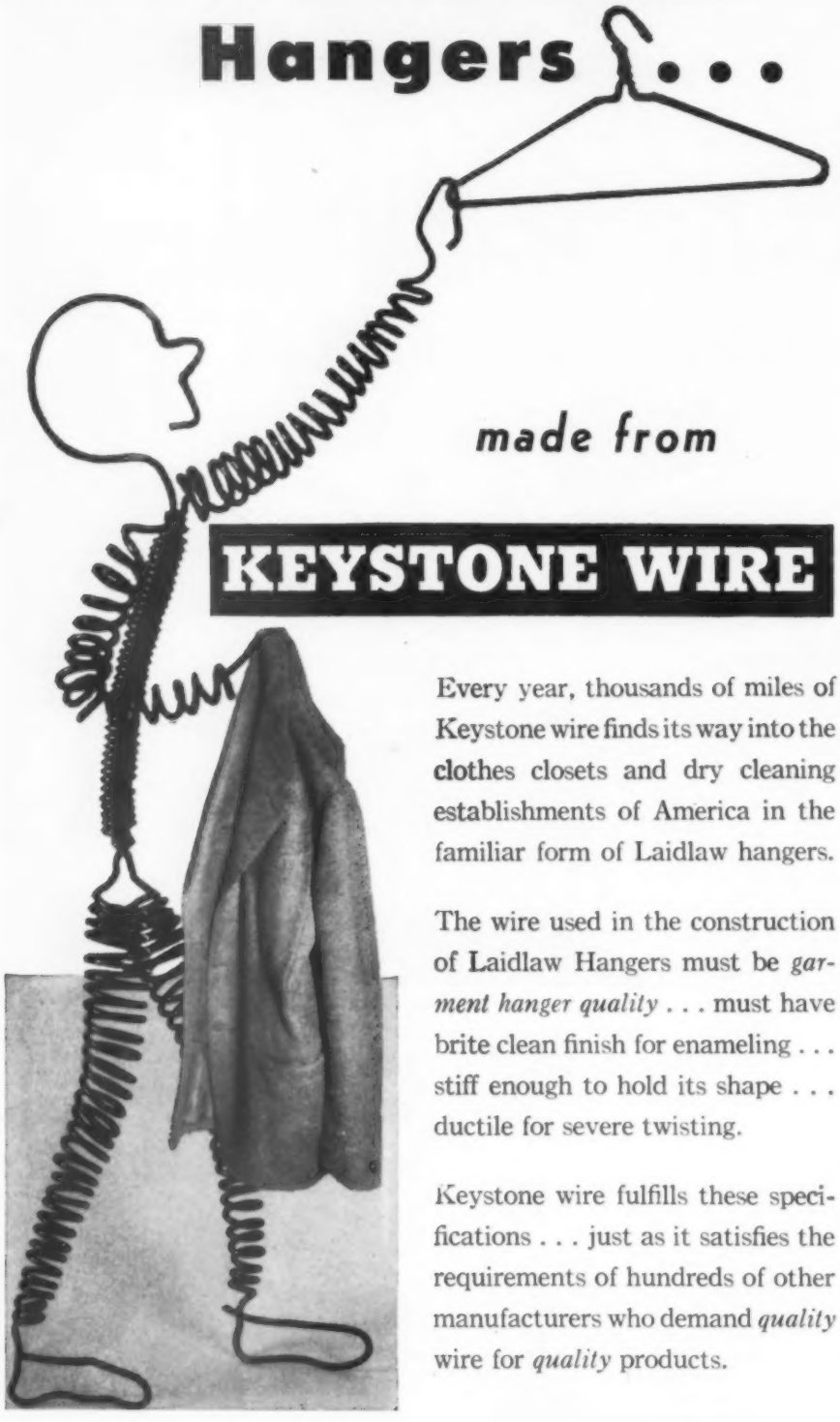
CENTRAL SCREW COMPANY

3501 SHIELDS AVE., CHICAGO 9, ILL. • 149 EMERALD STREET, KEENE, N. H.

Millions of LAIDLAW * Hangers . . .

made from

KEYSTONE WIRE



Every year, thousands of miles of Keystone wire finds its way into the clothes closets and dry cleaning establishments of America in the familiar form of Laidlaw hangers.

The wire used in the construction of Laidlaw Hangers must be *garment hanger quality* . . . must have brite clean finish for enameling . . . stiff enough to hold its shape . . . ductile for severe twisting.

Keystone wire fulfills these specifications . . . just as it satisfies the requirements of hundreds of other manufacturers who demand *quality* wire for *quality* products.

*Laidlaw Wire Company
Peoria, Illinois

KEYSTONE
MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE
for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

Process Industries Engineers Inc., Pittsburgh, Pa. has been organized for the sale of equipment of various nationally known manufacturers where engineered applications are satisfactory; and the design and fabrication of equipment where special designs are necessary.

Inland Steel Company, Chicago, Ill., has approved plans for enlarging its overall steel capacity and its facilities for producing tin mill products. Major benefits of the program are expected to be realized in 1950 and 1951. An estimated increase from 15 to 20 per cent of the company's ingot capacity will result from the program.

Schaffner Manufacturing Co., Emsworth, Pittsburgh 2, Pa., is a new manufacturer of buffing compositions, offering direct factory service to firms in eastern Ohio and western Pennsylvania.

The Billings and Spencer Company of Hartford, Conn., makers of drop forged wrenches and shop tools, have established an emergency service warehouse at 100 South Jefferson Street, Chicago 6, Ill.

The Queen Anne Manufacturing Company has been established at Wetumpka, Ala., for the manufacture of office desks in the popular price bracket. Herman J. Jaeger, Inc., 4808 Bergenline Ave., Union City, N. J. is the national distributor.

C. Allen Fulmer Company, Cincinnati, O., manufacturers of Fulmer hydraulic honing machines, has been granted the general distributorship throughout the United States of the Alexander Ball line of British-built honing tools.

Sprague Electric Co., North Adams, Mass., has acquired the Herlec Corporation, Milwaukee, Wis., manufacturers of ceramic capacitors and "Bulplate" printed circuits. The company has obtained possession of an automatic machine for the production of vitreous enamel capacitors.

General Electric Company has opened a $3,000,000 motor manufacturing plant at San Jose, Calif. At peak production the plant will be able to turn out more than 1,500 electric motors weekly. The factory will ultimately produce all of the company's output of single-phase capacitor integral motors.

Allegheny Steel Band Company, Carnegie, Pa., has begun the manufacture of "Steelband" strappings, seals, tensioners and sealers, together with other necessary accessories, for use in banding all types of packages, bales, boxes, pallets, etc.

Airquipment Company, Burbank, Calif., has purchased Aerol Co., Inc., Los Angeles, Calif., manufacturers of material handling equipment. Aerol Company will continue as a separate entity under its own name, as a subsidiary.

Hanson-Van Winkle-Munning Company has opened a new electrochemical laboratory at Matawan, N. J., for the purpose of carrying on experimental and service work in the electroplating and polishing field.

(*Please turn to page* 318)

HERE'S WHAT REPUBLIC DISTRIBUTORS SAY . . .

★ We Lower Your Costs . . .
Considering Service, Inventory Savings, and Emergency Co-operation

★ **Mr. Ashley De Witt**
Vice Pres. and Gen. Mgr.
Briggs-Weaver Machinery Company
309 N. Market Street
Dallas 2, Texas

In Youngstown, Ohio, and throughout the nation, people have confidence in the rubber products made by Republic men.

BUYMANSHIP and SALESMANSHIP

Let's look at your purchasing this way

Though you want the right price, isn't it product performance, availability, and delivery service that are of primary importance? It is good "buymanship" to consider all these factors when you are purchasing transmission belting, conveyor belting, and hose.

Republic Rubber Distributors, located throughout the nation are competitive in price on transmission belting, conveyor belting, and hose of all kinds. They are prepared to offer recommendations on product applications, they carry large inventories which are available at your beck and call . . . and personal attention to your purchasing requirements is their stock-in-trade. This is good "salesmanship." Only distributors give so much service.

Let's combine your good "buymanship" with Republic "salesmanship" for better product selection. Mail the coupon or write and we will give you the Republic distributor's name in your vicinity.

CHALLENGER TRANSMISSION BELTING

Top Performance on Toughest Service

Challenger Belting is recommended for all around transmission of power. It has maximum strength for severe stresses and shocks. Hard duck impregnated with live rubber friction gives minimum stretch and freedom from fastener troubles. Challenger has maximum flexing life for drives operating at high speeds over small diameter pulleys.

REPUBLIC RUBBER DIVISION
LEE RUBBER & TIRE CORPORATION · YOUNGSTOWN, OHIO
Lee Deluxe Tires & Tubes · Conshohocken, Pa.

MECHANICAL RUBBER GOODS BY
REPUBLIC RUBBER DIVISION

WHO REPRESENTS REPUBLIC IN MY AREA?
REPUBLIC RUBBER DIVISION · LEE RUBBER & TIRE CORP.
YOUNGSTOWN, OHIO

Name, title_____
Firm_____
Address_____
City_____ State_____

LET'S BRING THIS DOWN TO EARTH

Quality is a term that is often used broadly, casually. In the case of Chase, quality means more efficient, more economical, and more attractive containers for your products. And here's why:

Chase has been manufacturing bags for more than 100 years—and every year has marked some important improvement: in construction, in design, in printing, or in packaging technique!

Result: you get dependability, positive protection, and you get double-barreled satisfaction, too: 1) when your product is shipped, 2) when your product is received.

There is a Chase bag for every need—write us today for complete details.

1847

CHASE BAG CO.

GENERAL SALES OFFICES
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Hercules Powder Company, Wilmington, Del., has announced plans for the construction of an anhydrous ammonia unit to be located at its Hercules, Calif. plant. It is expected to be completed and in operation within 10 to 12 months.

American Steel & Wire Company, Cleveland, O., has announced that its No. 1 blast furnace at the Donora, Pa. steel and wire works has been blown out for relining after producing 2,003,500 net tons of pig iron.

Cornell-Dubilier Electric Corporation, South Plainfield, N. J., has purchased the Faradon Capacitor Division of the Radio Corporation of America.

Manhattan Rubber Division of Raybestos-Manhattan, Inc., Passaic, N. J., recently completed its 55th year. Today the division is one of the largest manufacturers of mechanical rubber goods. About 4,000 persons are employed at the plant that covers more than a million square feet of floor space.

Columbia Radiator Company, McKeesport, Pa., has changed its corporate name to Columbia Foundry Company. The company intends to withdraw entirely from the heating boiler and radiator business and devote its facilities to the manufacture of production gray iron castings.

The Egyptian Lacquer Manufacturing Company has begun construction on a midwestern division at Lafayette, Ind. Products will include the company's complete line of synthetic and lacquer industrial finishes and thinning materials.

Pittsburgh Plate Glass Company, Pittsburgh, Pa., has acquired controlling stock interest in the Midvale Coal Company, New Philadelphia, O. The coal company is being liquidated and its mine will be operated as the Columbia Coal Division of Pittsburgh Plate Glass Company.

Stewart-Warner Corporation, Chicago, Ill., has purchased the physical assets, patents, and trade-marks of Heating Research Corporation, Anderson, Ind. Production, marketing and other operations of the newly acquired business will be integrated with the South Wind Division of Stewart-Warner at Indianapolis, Ind.

National Bearing Division of the American Brake Shoe Company has opened a new non-ferrous foundry at Meadville, Pa., at which production for the eastern area will be concentrated.

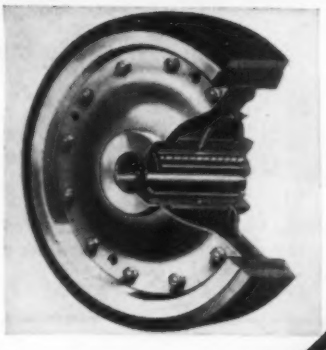
Republic Steel Corporation, Cleveland, O., has signed a ten-year lease on the surplus, government-owned blast furnace and facilities at Gadsden, Ala., through the War Assets Administration.

F. A. Smith Manufacturing Co., Inc., Rochester, N. Y., has announced a change of name to Fasco Industries, Inc.

General Electric Company has leased from the War Assets Administration the former Remington Rand plant in Johnson City, N. Y., for an expansion of facilities to manufacture special equipment for the air force.

(*Please turn to page* 320)

DARNELL
CASTERS & WHEELS



Darnell Dependability assures savings, service, safety, speed. A caster or wheel for every use.

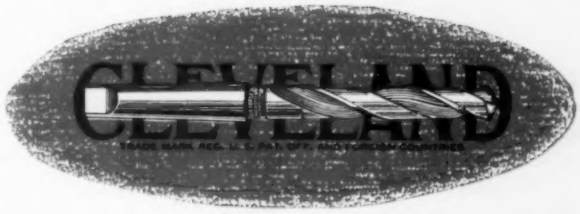
DARNELL CORP. LTD
LONG BEACH 4, CALIFORNIA
60 WALKER ST., NEW YORK 13, N.Y.
36 N. CLINTON, CHICAGO 6, ILL.

Choosing the Right Stock Drill

- **Cuts Your Cost Per Hole**
- **Eliminates Breakage**
- **Speeds Production**

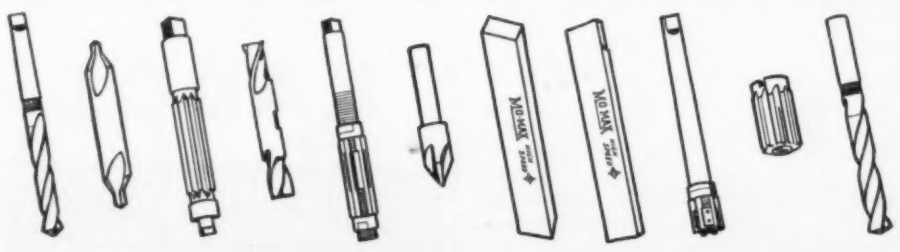
Yes, there are many advantages in selecting the right drill for each job. For instance, one of our customers was getting excessive breakage with regular jobbers' length drills on the set-up pictured here—drilling holes 7/16 inch deep in stainless steel. A *Cleveland* Service Representative was able to correct this situation by recommending a stub screw machine drill which, because of its heavier construction and shorter length, is giving complete satisfaction. *Your* drilling problems, too, perhaps can be solved by a *Cleveland* Service Representative—without cost or obligation. Contact our nearest Stockroom, or . . .

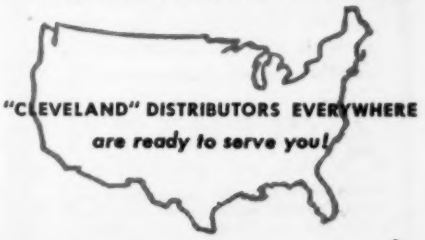
Telephone Your Industrial Supply Distributor



THE CLEVELAND TWIST DRILL CO.
1242 East 49th Street Cleveland 14, Ohio
Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5
Los Angeles 11 • London W. 3, England

ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER CLEVELAND TOOLS





YOU'RE ALWAYS RIGHT WITH STAR

From the start you'll notice how much faster Star Blades cut metals... and with a truer cut, that leaves a cleaner surface. Tough, durable Star Blades lessen "time-outs" on the job, too. You see, every Star Blade is made of finest high-grade steel... precision-set teeth assure fast cutting and full side clearance. You'll appreciate the metal-cutting economies of Star Blades.

Your local jobber or distributor will be glad to help you choose a Star Blade to suit your job, ask him for the NEW Star Wall Chart for your shop... the Star Metal Cutting Booklet for pocket or tool kit—they both contain a world of useful information and are absolutely FREE.

CLEMSON
BROS., INC. • Middletown, N. Y.
Makers of hand and power hack saw blades, frames, metal cutting band saw blades and the Clemson Lawn Machine.
5208

The Johnson Matthey Company and P. R. Mallory & Co., Inc., Indianapolis, Ind., manufacturers of metallurgical and electronic products have consolidated. The new Canadian organization will be known as Johnson Matthey and Mallory Limited, and will be located at 110 Industry St., Toronto 15, Ont., Can.

Worthington Pump and Machinery Corporation, Harrison, N. J., has announced that the manufacturing and distributing activities of its subsidiary, Ransome Machinery Company, will be conducted by the parent corporation.

Adamas Carbide Corporation, formerly of Long Island City, N. Y., has moved to Harrison, N. J., to a plant four times the size of the former location.

Richards Machine Tool Company, manufacturers of machine tools and micrometers will hereafter be known as Rimat Machine Tool Company. Plant and offices of the company have been moved to 1117 Air Way, Glendale 1, Calif.

Straub Manufacturing Co., Oakland, Cal., has announced that the Pennsylvania Crusher Co., Liberty Trust Building, Philadelphia, Pa., has acquired the exclusive manufacturing and sales rights in eastern United States and Canada covering the Kue-Ken line of jaw crushers and gyratory crushers.

Cornell-Dubilier Electric Corporation, South Plainfield, N. J., has purchased from Maguire Industries, Inc. all of the stock of Radiart Corporation, Cleveland, O.

* * *

TEN PER CENT PRICE CEILING ANNOUNCED BY G-E APPARATUS DEPT.

A change in the year-old price protection policy of General Electric's apparatus department, reducing the amount its contract prices can be increased from 20 to 10 per cent, has been announced by W. V. O'Brien, general sales manager. The new 10 per cent price ceiling applies to all apparatus lines except for large power transformers above 15,000 kva, waterwheel generators, and synchronous condensors, and was effective December 27.

Simultaneously, Mr. O'Brien announced an increase of approximately five per cent in the price of motors rated 50 hp and above, and a 10 per cent increase for large turbine generators rated 20,000 kw and above. "These adjustments are necessitated by increased manufacturing costs in these particular lines," Mr. O'Brien said.

Mr. O'Brien said that the 20 per cent limitation on price increases established December 1947 has been regarded as successful in keeping prices of G-E apparatus as low as possible relative to cost.

"We are reducing the ceiling to 10 per cent in the interests of stabilizing prices and encouraging the continuation and fulfillment of expansion programs under way throughout industry," O'Brien said. "Any price reduction made in the future would, of course, become effective immediately on orders on the books."

Another DOLGE First!

KADOL

The New LIQUID Floor Cleaning Compound

DEVELOPED IN DOLGE LABORATORIES

KADOL is *today's* method of cleaning various types of flooring because its concentrated, brilliant *liquid* form permits *pouring* to make an economical dilution of *only two ounces to the gallon of water.* Easy to handle — and it goes a long, *clean* way in keeping your floors immaculate.

KADOL is *neutral* — can be used safely on linoleum, cork, also wood mastic, tile and many other surfaces, and is recommended as a *general cleaner.* No rinsing is ordinarily required; when a KADOL-cleaned surface is dry-mopped, an attractive polish results.

KADOL has no druggy, clinging odor associated with usual cleaning compounds. Its fragrance is pleasant and unobtrusive.

Write for the new KADOL booklet which explains its many advantages, and see your DOLGE Service Man.

KADOL

The C. B. DOLGE CO.

WESTPORT, CONNECTICUT

Moistens instantly

Sticks tight quickly

Far easier to apply

Stronger protection

Packaged in cartons

Moistureproof liner

Controlled uniformity

Faster . . . stronger . . . better in every way!

Faster. Blue Ribbon superstandard gummed tape speeds up your package sealing. It moistens instantly. One firm sweep of the hand puts it down to stay. Blue Ribbon is *supple-ized** to make it flexible, easier and faster to apply.

Stronger. Your packages reach their destinations in good condition when you use Blue Ribbon tape. Blue Ribbon's fast-acting adhesive grips your container with a strong weather-resistant bond. The tough long fiber kraft adds further protection to your merchandise.

Better in every way. You will find this new superstandard golden-brown gummed tape the answer to your sealing problems. Its 18 advantages combine to give you safer, stronger, neater packages.

* Trade Mark

Send now

for your free copy of this helpful booklet "How to speed up sealing in your shipping room" and the name of your nearest Blue Ribbon distributor. No obligation.

SEAL IT RIGHT WITH GUMMED TAPE

*Blue Ribbon** SUPERSTANDARD GUMMED TAPE

HUDSON PULP & PAPER CORP., DEPT. C-2, 220 EAST 42ND STREET, NEW YORK 17, N. Y.

The Fasteners that add EXTRAordinary strength to your product EXTRAordinary speed to its assembly----

Kaufman Cold-Forging Processed

Cleveland High Carbon Heat Treated Cap Screws

● The extra toughness of Cleveland High Carbon Heat Treated Cap Screws adds greater safety to your product; extra precision forming speeds assembly, minimizes rejects. These extra values to you are the result of the Kaufman Double Extrusion Process of cold forging—a method that assures you stronger threaded fasteners than any other known process. It pays you to specify and buy Cleveland High Carbon Heat Treated Cap Screws. The Cleveland Cap Screw Co., 2917 East 79th St., Cleveland 4, Ohio; Warehouses, Chicago and Philadelphia.

CLEVELAND *Top Quality* **FASTENERS**

ORIGINATORS OF THE KAUFMAN DOUBLE EXTRUSION PROCESS

Specialists for more than 30 years in

CAP SCREWS, SET SCREWS, MILLED STUDS

Ask your jobber for Cleveland Fasteners

OUTLOOK FOR COPPER, ZINC AND LEAD IN 1949

By T. E. Veltfort,
Manager Copper & Brass
Research Associates

Whether or not there will be a sufficient supply of copper, zinc and lead in 1949 to meet the requirements of the brass mills, wire mills and other copper consuming industries will largely depend on the following three factors:

1. The amount of these strategic metals which the Government will stockpile in its National Defense Program.

2. The labor situation in the mines, mills and in transport. Capacity production will be necessary to meet current demand.

3. The quantity of these metals which can be imported from abroad, and in turn, the shipments which will have to be made abroad on account of the European Recovery Program.

Even though there are no labor disturbances in the copper mines during the year and they are operated at capacity they cannot supply enough copper to meet domestic requirements. It is generally believed that 1949 will be one of continued prosperity in our country. If this turns out to be true, the demand for copper may well reach 1,400,000 tons. The mines in the United States cannot produce such a tonnage so it will be necessary to import the red metal from the Mexican and South American mines generally operated by companies in the United States. The amount of secondary metal (scrap) will also play an important part in meeting demand.

There exists today an acute shortage of copper. In fact, the supply is so tight that the brass and wire mills are finding it difficult to obtain a sufficient supply to continue normal operation. This shortage was augmented by the strike at the great Utah open-cut mine of Kennecott Copper Corporaion. Normal production lost on this account is estimated at about 23,000 tons a month.

It would, of course, be helpful if the owners of the African mines could be induced to speed up production to meet the requirements of Great Britain and Continental Europe and thus lessen the demand for that purpose from South American sources on which we largely rely. Reports from London say an earnest effort is being made to increase production in Rhodesia, South Africa, by opening new mines, construction of new railroads from the mines to tidewater and enlarging port facilities. Great Britain has imported large tonnages of copper from South America now needed badly by our own brass mills. Despite the fact that 1948 imports of copper so far have increased over those of last year, the combined fabricators and refiner's stocks of the metal in the United States have declined substantially.

Practically every basic American industry is dependent on copper or copper-base alloys in the manufacturing of its products. To make brass, bronze and other copper-base alloys to meet the varying demand of industry, zinc and lead

(*Please turn to page* 324)

AN EVEN bigger PLANT

FOR STILL better SERVICE

on PURDY STEEL and ALUMINUM

GOOD NEWS!

MORE STEEL... FASTER SERVICE..

25,000 square feet of additional space includes the finest in steel handling and shearing machines. Among the equipment installed are floor scales of 12,500 lbs. capacity, three shearing machines, and two overhead traveling cranes. The new loading dock accommodates three trucks, and four railroad cars can be handled simultaneously. These added facilities implement, in part, the determination of the entire A. R. Purdy Company to provide a friendly, adequate and completely able warehouse service for steel and aluminum consumers.

ASK FOR THE PURDY HANDBOOKS — THEY'LL BE VALUABLE ADDITIONS TO YOUR FILES!

THE PURDY QUALITY LINE:

STAINLESS STEELS • COLD FINISHED STEELS
SPRING STEELS • TUBING • DRILL ROD
COLD ROLLED STRIP STEEL
ALUMINUM SHEETS AND COILS

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INC

Orient Way & Page Ave., Lyndhurst, New Jersey

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TO TURN PROSPECTS INTO CUSTOMERS

THEY'LL CARRY IT—USE IT—AND REMEMBER YOU!

For a premium that will pay dividends, give this new nationally known Nail Clipper. It's handsome, it's compact and it's useful to men and women alike. And because people tidy their nails every day, it advertises your company seven days a week, every week of the year. Not a toy! Not a gadget! A mechanically perfect instrument! Bright as a jewel, light as a coin. Slips into pocket or purse or through chain. Available in quantity at attractive low cost.

AN INEXPENSIVE WAY TO MAKE FRIENDS AND GAIN CUSTOMERS!

For sample and information on low prices write, without obligation, to:

THE W. E. BASSETT CO.
Dept. A-110 , Derby, Conn.

RITCO
MACHINED FORGINGS and SPECIAL FASTENERS

Here's your source for steel or non-ferrous parts of tough structure and close dimensional accuracy. RITCO Bright Finish drop forgings in weights from ¼ lb. to 15 lbs. are smooth, flash-free — require minimum machining. Come to RITCO for precisely machined, ground or threaded parts and assemblies. Let us know your requirements: estimates gladly submitted.

REMEMBER RITCO FOR
DROP AND UPSET FORGINGS
COMPLETE MACHINING FACILITIES
SPECIAL BOLTS, NUTS AND STUDS
MILLED BODY BOLTS

RHODE ISLAND TOOL COMPANY
148 West River Street
P. O. Box 1516, Providence 1, R. I.
Serving American Industry Since 1834

(*Continued from page 322*)

and a number of other metals are required besides copper and several of these are in short supply at the present time.

The electrical industry is the largest consumer of copper. Next to the electrical industry, the automotive and building industries are the greatest consumers of copper and copper-base alloys. The average 1949 model car will have approximately 45 pounds of the red metal and its alloys in its construction. Trucks and buses also contain large amounts of these metals. Mr. Alfred P. Sloan, Jr., Chairman of General Motors Corporation, and other top executives of automobile companies are of the opinion that this industry in 1949 will probably set a new peace-time record for building cars, trucks and buses. This means copper and brass products. With about 10,000,000 new housing units required in the next decade building activity should remain high. The demand for copper and copper-base alloys in 1949 for this purpose should be about the same tonnage as that for the automotive industry. Each will need about 250,000,000 pounds of the red metal and its alloys during 1949.

Copper tube is in great demand for hot and cold water lines, vent, soil and waste lines and for radiant heating. Some manufacturers of copper tube have since the end of the last war almost doubled capacity, but demand has exceeded output due largely to the use of copper tube for radiant heating in all types of buildings. This product is being turned out at more than four times the prewar average.

The railroads and steamship lines have elaborate plans for the construction of new equipment. The railroads of the nation require large numbers of new diesel-electric locomotives, Pullman cars, day coaches, dining cars, and freight cars. The Pennsylvania Lines alone have a program for new equipment that involves an expenditure exceeding $200,000,000. New ocean liners, cargo ships and tankers are under construction for the steamship lines. Into such railway and steamship equipment will go millions of pounds of copper and copper-base alloys.

Other basic industries which will require large tonnages of copper and its alloys, particularly brass and bronze, are the hardware industry; the clock and watch industry; radio and television; air conditioning; refrigeration; and even such manufactures as wire screen cloth to keep buildings free from flies and other insects, tableware and many others too numerous to mention. Without copper and copper-base alloys these products cannot be manufactured. There may be alternates but there are no real substitutes for copper or copper-base alloys.

Since the end of the war the brass mills have taken over a number of fabricating plants built by the Government during the war to supply the United States and other of the United Nations with war armament. In addition, several companies have constructed new plants, specifically in Alabama and California.

(*Please turn to page 328*)

Records prove the unusual ability of Whitney Roller Chains to withstand shock loads without breakage. A case in point is the following application:—

The head rig drive to the large nine foot Sumner Band Mill at Universal Box Company Ltd. incorporates 3 strand, 1½″ pitch, Triplex Whitney Roller Chains for positive transmission of power from the 300 HP synchronous motor. Despite surges in power up to 650 HP (or 350 HP overloads) during the cut run, Whitney Chains withstand these tremendous overloads and are performing day in and day out without failure. In addition to absorbing shock loads, Whitney Chains transmit full rated horsepower without slippage or friction loss. They deliver constant power smoothly and efficiently . . . stand up under the toughest of operating conditions. Write for information.

CHAIN DRIVE IS BETTER

- Positive grip
- Transmits full horsepower
- Simplifies transmission designs
- Low maintenance
- Ease of installation
- Long operating life
- Constant uniform speeds
- High resistance to shock loads
- High load carrying capacity

WHITNEY CHAIN & MFG. CO.

Division of Whitney-Hanson Industries Inc.

207 Hamilton Street, Hartford 2, Connecticut

Want Additional Product Information? See Page 19.

NEW PYOTT QUE-DEE CAST-IRON PULLEYS

Pyott QUE-DEE Pulley with TAPER TIGHT Bushing

IMMEDIATE DELIVERY from Complete Factory Stock or your Mill Supply

Reduce Installation Cost. Provide Positive Lock on Shaft. Easily Installed or Removed by Tightening or Loosening 3 Bolts.

Pyott famous Red Face Pulleys are now available in the Que-Dee (Quick Detachable) style and are used with the same interchangeable Taper-Tight Bushings which have long been used with Pyott Que-Dee V-Belt Sheaves. That means easier, faster, more economical pulley installation and removal. It assures a positive fit of pulley on shaft, even where a shaft is slightly over-size or under-size, because the Taper-Tight Bushing provides a positive, powerful pull-up by merely tightening three bolts. The new Que-Dee Pulleys are available in popular diameters and face widths.

WRITE FOR CATALOG 70A

EASY TO INSTALL AND REMOVE

The Pyott Taper-Tight Bushing with standard key-way slips easily over the shaft. The tapered hub of the Que-Dee Pulley slides easily into position on the Taper-Tight Bushing. A few turns on tightening bolts pull pulley, bushing and shaft into a positive, powerful, pull-up fit. For dismounting, the tightening bolts, inserted in dismounting holes, act as jack screws to loosen the pulley.

PYOTT

FOUNDRY & MACHINE CO.

328 NORTH SANGAMON STREET

CHICAGO 7, ILLINOIS

MONROE 6-0296

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Oakland, Sacramento, San Francisco, San Jose, Stockton
Zellerbach Paper Co. . . . . Fresno, Los Angeles, Oakland, Sacramento, San Diego, San Francisco, San Jose, Stockton

COLORADO
Carpenter Paper Co. . . . . Denver
Graham Paper Co. . . . . Denver

CONNECTICUT
Charles F. Hubbs & Co. Bridgeport
The Rourke-Eno Paper Co. Hartford

GEORGIA
Graham Paper Co. . . . . Atlanta

IDAHO
Blake, Moffitt & Towne . . . . . Boise
Carpenter Paper Co. Boise, Pocatello

ILLINOIS
Abana Products . . . . . Chicago
Bradner Smith & Co. . . . . Chicago
Graham Paper Co. . . . . Chicago
Knox & Schneider Ppr. Co. Chicago
Newhouse Paper Co. . . . . Moline
S. V. Cain, Inc. . . . . Peoria

INDIANA
Crescent Paper Co. . . . Indianapolis

IOWA
Carpenter Paper Co. . . Des Moines, Sioux City

KANSAS
Carpenter Paper Co. . . . . Topeka
Graham Paper Co. . . . . Wichita

KENTUCKY
Graham Paper Co. . . . . Louisville

LOUISIANA
Graham Paper Co. . . . New Orleans

MARYLAND
Hubbs & Corning Co. . . . Baltimore

MASSACHUSETTS
Carter Rice & Co. Corp. . . . . Boston
Charles A. Esty Paper Company . . . . . Worcester
Bulkley, Dunton & Co., Inc. . . . . Springfield

MICHIGAN
Crown-Ann Arbor Paper Company . . . . . Ann Arbor
The Whitaker Paper Co. . . . . Detroit
Beecher, Peck & Lewis . . . . . Flint
Graham Paper Co. . . Grand Rapids
Crown Paper & Bag Co. . . Jackson
Bermingham & Prosser Company . . . . . Kalamazoo
The Weissinger Paper Company . . . . . Lansing
Reid Paper Co. . . . . Saginaw

MINNESOTA
Graham Paper Co. . . . . Minneapolis
Carpenter Paper Co. . . Minneapolis, St. Paul

MISSOURI
Carpenter Paper Co. . . Kansas City
Graham Paper Co., N. Kansas City, St. Louis
Prunty Seed & Grain Co. . . St. Louis

MONTANA
Carpenter Paper Co. . . . . Billings, Butte, Great Falls

NEBRASKA
Carpenter Paper Co., Grand Island, Lincoln, Omaha

NEW MEXICO
Carpenter Paper Co. . . . Albuquerque

NEW YORK
Hubbs & Howe Co. . . . . Buffalo
Hubbs Paper Co., Inc. . . . Hollis, L.I.
Charles F. Hubbs & Company . . . . . New York
Herbert A. Post, Inc. . . . New York
The Alling & Cory Co. . . Rochester
J. & F. B. Garrett Co. . . . . Syracuse

NORTH CAROLINA
Henley Paper Co. . . . . High Point

OHIO
The Chatfield Paper Corp. . . . . Cincinnati
The Whitaker Paper Co. . Cincinnati
Hubbs & Howe Co. . . . . Cleveland
The Scioto Paper Co. . . . . Columbus
The Ohio & Michigan Paper Company . . . . . Toledo

OKLAHOMA
Carpenter Paper Co. of Okla. . . . . Oklahoma City
Graham Paper Co. . Oklahoma City

OREGON
Blake, Moffitt & Towne . . . . Portland
Zellerbach Paper Co. . . . . Portland

PENNSYLVANIA
Hubbs & Howe Co. . . . . Erie
D. L. Ward Co. . . . . Philadelphia
The Chatfield & Woods Co. of Pa. . . . . Pittsburgh

RHODE ISLAND
Carter, Rice & Co. Corp. Providence

TENNESSEE
Graham Paper Co. . . . . Memphis, Nashville

TEXAS
Graham Paper Co. . . Dallas, El Paso, Houston, San Antonio
Carpenter Paper Co. . Fort Worth, Dallas, San Antonio, Austin, Harlingen, Lubbock

UTAH
Carpenter Paper Co. . . . . Salt Lake City, Ogden
Zellerbach Paper Co. . . . . Salt Lake City

WASHINGTON
Blake, Moffitt & Towne . . Seattle, Spokane, Tacoma
Zellerbach Paper Co. . . . . Seattle, Spokane
Spokane Paper & Stationery Company . . . . . Spokane

WISCONSIN
American Paper Co. . . . Milwaukee
Wisconsin Paper & Products Co. . . . . Milwaukee
Sawyer Paper Co. . . . . Neenah
Service Paper Co. . . . . Racine

*T. M. REG. U. S. AND CAN. PAT. OFF.

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122 E. 42nd St., New York 17 • 8 S. Michigan Ave., Chicago 3
155 Sansome St., San Francisco 4 • 22 Marietta St., Atlanta 3, Ga.

Want Additional Product Information? See Page 19.

Automatic Serve-Up Packages

100% Grit Free!

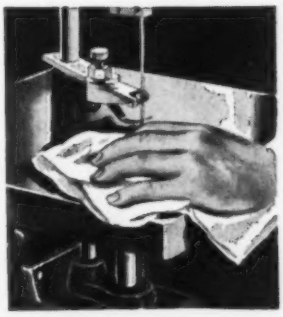
Kimwipes*

industrial tissues

for wiping and polishing

1. INSPECTION WIPING

2. OPTICAL CLEANING



3. MACHINE MAINTENANCE

Downy-soft, 100% free of foreign matter, pleasant to handle, Kim*wipes** industrial wiping tissues pick up the tiniest particles of soil without scratching, without linting. Recommended for use on highly finished surfaces. Flexible to clean corners and hard-to-reach crannies. Absorb up to 15 times their weight in liquids.

So inexpensive that a fresh, clean tissue can be used for each application—and thrown away! "Indispensable" around precision tools and instruments, in shops, laboratories, packing rooms, stores—in almost every type of business. Order a supply of Kim*wipes* from our nearest distributor—see list on page opposite.

Write us on your business letterhead for further information. Address Kimberly-Clark Corporation, Neenah, Wisconsin.

Kimwipes

A PRODUCT OF Kimberly Clark RESEARCH

INDUSTRIAL WIPING TISSUES

*T. M. REG. U. S. AND CAN. PAT. OFF.

Thousands of PRODUCTION LINE RECORDS PROVE CONCLUSIVELY

AMP PRE-INSULATED *Solderless* TERMINALS

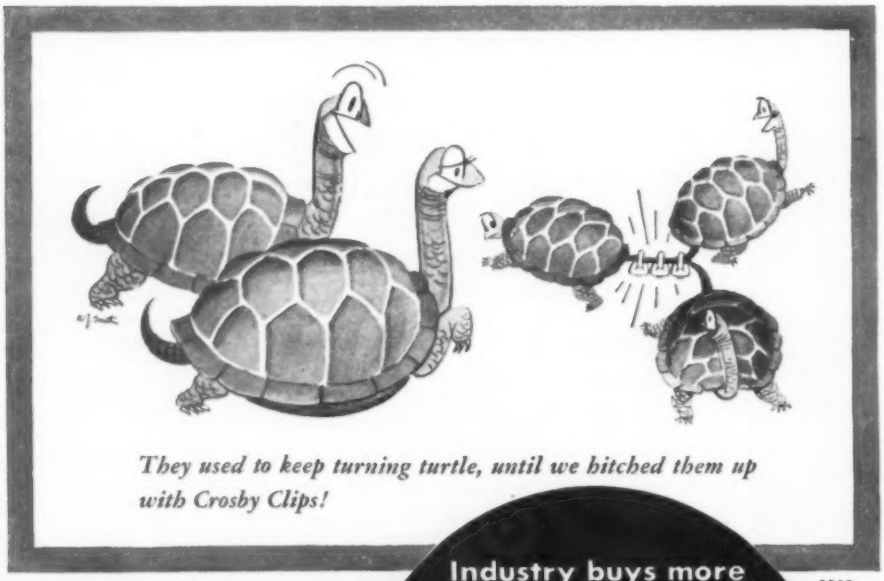
THAT the cost of installing separate insulation tubing is approximately equal to the cost of installing a solderless terminal.

AND THAT AMP patented Pre-Insulated Solderless Terminals reduce the installed cost of wire termination because

ONE CRIMPING OPERATION PRODUCES A PERFECT INSULATED CONNECTION. (The insulation is permanently bonded to the pure copper terminal barrel, and when crimped with AMP tool, forms a high quality permanently insulated connection.)

Available for wire sizes 22 to 10 inclusive in a wide variety of tongue shapes and stud hole sizes, AMP patented Pre-Insulated Terminals are eliminating costly and unnecessary installation methods. Samples will be sent upon request together with Catalog Section 10.

AMP **AIRCRAFT-MARINE PRODUCTS INC.**
1319 North 4th Street, Harrisburg, Pa.
Sole Canadian Representative:
F. Manley & Sons, Ltd., Toronto, Ont., Canada



They used to keep turning turtle, until we hitched them up with Crosby Clips!

9903

Fasten wire rope with CROSBY CLIPS. Safe, simple, speedy . . . applied anywhere by one man with one wrench. *Drop-forged*, not cast. Hot dip galvanized. All sizes . . . for ⅛" to 3" wire rope. Distributors everywhere; made only by AMERICAN HOIST AND DERRICK CO., St. Paul 1, Minnesota.

Industry buys more **CROSBY CLIPS** than all other drop-forged fasteners!

ALSO MAKERS OF THE AMERICAN HANDIWINCH AND AMERICAN BLOCKS AND SHEAVES

(*Continued from page* 324)

In other words, every possible step is being taken by the Industry to meet the large demands on it and it must now depend on the availability of its principal raw materials to do the job which is required of it.

* * *

1949 BUSINESS 13% HIGHER THAN 1948, INDUSTRIAL ECONOMIST PREDICTS

Business will continue to boom in 1949, at a level topping the record year of 1948, according to Frank D. Newbury, dean of economists in industry.

Mr. Newbury, consulting economist for Westinghouse Electric Corp., predicts a gross national product of $260 billion for 1949—up $35 billion over 1948—in a copyrighted article published in *Industrial Marketing*, national business paper of industrial sales and advertising.

Mr. Newbury's forecast is based on the same technique he applied in correctly forecasting record business in 1947 and 1948—at a time that other economists in government and industry were warning of impending depression.

Describing forecasting as "the art of drawing adequate conclusions from inadequate information," Mr. Newbury warns against basing major decisions on "almost whimsical appraisals of the business outlook . . . on pure guesswork, the Dow-Jones averages, or the latest (and most pessimistic) Washington letter."

Mr. Newbury's own technique, reduced to its simplest terms, is based on the important relationship between total investment spending and total national production. But, while the initiating effect of investment spending on business activity is generally recognized, what is possibly new in the Newbury procedure is the grouping of government expenditures of an investment nature with the more familiar investment expenditures of private business. Total investment is the key to total product, according to this theory, the ratio being roughly that of $20 to $100.

In support of this contention, Mr. Newbury's article says, "During peaceful, prosperous years there is a fairly constant ratio of total investment expenditures to total national production of about 20%. In 1929 with gross national product of about $100 billion, total investment amounted to $20 billion. In 1927, with gross national product of $231 billion, total investment dropped much more to bottom of the long depression—in 1932—national product dropped to $58 billion and total investment dropped much more to about $5 billion. So, over this wide range from prosperity to depression, and with the war and post-war growth, investment expenditures have been a dependable guide to total business activity."

Thus it is implicit in Mr. Newbury's system that, to predict gross national product for 1949, he must first predict total investment. He admits this is "a hazardous undertaking, and the result can be an educated guess," but goes

(*Please turn to page* 330)

COORDINATED packaging today demands every type of paperboard container. No one package answers the requirements for every product—many products require several types of packaging . . . . .

That's why OLD DOMINION makes and recommends the consideration of every type of paperboard container . . . .

That's why OLD DOMINION designers and packaging engineers can help you get the *best in packaging, most economically.* Why not write for complete line Folder #14.

OLD DOMINION *Box Company Inc.*

PLANTS LOCATED THROUGHOUT THE SOUTH

CHARLOTTE, N. CAROLINA

THE SOUTHERN BOX MAKER WITH A NATIONAL REPUTATION

FELT! BY THE YARD

FELT! BY THE ROLL

FELT!

IN CUT PARTS

WE MAKE IT . . . WE CUT IT . . . WE SELL IT . . .

All grades
All colors
All textures
All thicknesses
All consistencies

Precision cut felt parts is a *special* part of our business. With your first order you'll know we mean precision. For your parts will be engineered to your exact specifications . . . just the way you've always wanted to receive them. Write for details today.

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Makes the Felt for the Parts it Cuts

THE FELTERS COMPANY
Please send my free copy of the Felters Precision Cut Felt Parts Manual.

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Company_____
Address_____

(*Continued from page 328*)

on to discuss the investment factors which enter into his consideration:

"It is evident from the figures for the last two years that construction and producers' durable equipment were still in their active expansion phases in 1948. Also, experience tells us that both of these cycles have long periods, and, characteristically, their annual values do not change suddenly from expansion to contraction. Their cycles show well-rounded tops. Consequently it is a reasonable estimate that the increase for both these indusries will continue for at least another year.

"Inventory accumulation is expected to continue in 1949, but only at the relatively small figure of $1 billion. Net foreign investment is expected to continue at the same figure as in 1948—about $2 billion. Investment in construction is expected to be $15 billion. Investment in producers' durable equipment is expected to be $21 billion. Thus total private investment should run to a total of $39 billion.

Mr. Newbury then looks to the foreign situation, takes into account the freer-spending philosophy that may be expected of the incoming Democratic administration, and pegs government investment for 1949 at $20 billion—making a total national investment of $59 billion.

"Having thus arrived at this estimate of total investment expenditures, we are ready to translate investment spending," he continues, "into an estimate of business activity."

Figure Prediction for 1949

"In 1947, $50 billions of investment corresponded with $231 billions of gross national product—the market value of total national production of all kinds of goods and services. In 1948, $56.5 billions of investment increased gross national product at a slightly higher ratio up to $225 billions. Then, at about the same ratio, $59 billions of total investment would correspond with $260 billions of gross national product." This last figure is Mr. Newbury's prediction for 1949.

A shooting war, he adds, a boost in taxation affecting private investment, a change in Federal Reserve credit policies, a major change in the wholesale price level, or a serious break in farm prices (most unlikely under present government policies) would change the picture.

In conclusion, Mr. Newbury's forecast points out, "One final consideration should receive attention: We have enjoyed virtual capacity production for two years, and his forecast anticipates another year of full production. Such a long period of capacity production and employment is unusual, to say the least, and it is natural that business men should be fearful of near-by collapse. Certainly the current abnormal demand for housing, automobiles, steel and copper will be satisfied someday, and a decline in investment spending and in consumer sales will then begin. But the decline will be slow and moderate; there is little reason to fear the kind of collapse we had in 1921 or 1929."

Want Additional Product Information? See Page 19.

STAINLESS "SPOON"
for a Fish's Dinner

Courtesy Wm. J. Hunt Mfg. Co.

Mackerel, stripers, sailfish, even trout go for this stainless Drone—a flashing, darting imitation of live bait, expertly designed to lure hungry heavyweights to a final meal.

Originally made of lacquered nickel-silver, these spoons are now made from stainless steel for lasting brilliance. First trials with stainless, however, were disappointing. The usual commercial grades gave trouble—buffing, even electro-polishing could not bring out the brilliance necessary for an effective lure. Again, these grades proved too soft to properly lock the hook—and hold it in the first lunge of a strike.

The Frasse recommendation was stainless steel of the same analysis—but rolled with a special temper. Result—a more rigid spoon with a properly seated hook, and a more appetizing gleam while trolling. Added advantages included production increases in stamping and forming, and reduced time cycle in polishing bath.

Frasse stocks stainless steel in every commercial form—bars and sheets, strip and tube—even valves, pipe fittings and electrodes. But Frasse stainless *engineering* service is equally handy—and just as useful. For stainless steels, and qualified engineering suggestion in their application—call Frasse. *Peter A. Frasse and Co. Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) Jersey City • Syracuse • Hartford • Rochester • Baltimore.*

FRASSE
for Stainless Steels and Tubing

NOW! Jumbo Stainless Sheets from Warehouse Stock!

4A

This new Frasse stock list supplement shows many new "unusual" items—*big* stainless sheets up to 72" x 144", *square* type 303 bars, *square* stainless tubing. You'll find it a handy source and reference book. Send for your copy today—no obligation.

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Please send me a copy of your new stainless stock list supplement.

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Want Additional Product Information? See Page 19.

PIPE CUTTING Made Easy!

RIDGID Cutter assures clean cuts, fast, with least effort

● Slap this sturdy RIDGID cutter on a pipe and roll it right through in a few easy turns, with surprisingly little effort. Efficiency-balanced, it handles easily. The tool-steel thin-blade cutter wheel sinks cleanly through pipe and conduit, leaves practically no burr—every RIDGID cutter is factory-tested to make sure it tracks perfectly. Your choice of 5 sizes to 6" pipe; 4-wheel cutters to 4." Buy RIDGIDS at your Supply House.

RIDGID

WORK-SAVER PIPE TOOLS

THE RIDGE TOOL CO. • ELYRIA, OHIO

MOVIE ON MATERIALS HANDLING "THE ONE-MAN-GANG"

A new industrial movie on materials handling entitled "The One-Man-Gang" has been announced by Towmotor Corporation, Cleveland, Ohio. This 30-minute picture takes its audience into the plants of a number of leading manufacturers to show the exact methods that are being employed to make startling reductions in the costs of materials handling. The picture gives a comprehensive delineation of just how vital fork lift trucks and tractors have become in modern, efficient plant operations. The plants "visited" include the Lily-Tulip Corporation, Ferro Machine & Foundry Co., Poor & Company, Youngstown Sheet & Tube, American Airlines, Pepsi-Cola, and the Cleveland Builders Supply. A 20-page booklet illustrated with typical views from the picture, is available from the Towmotor Corporation.

The picture show how "Mass handling —the systematic movement of the most units in the shortest time and at the lowest cost" becomes the most effective means of cost reduction that can be effected tdoay.

AMERICAN STEEL & WIRE ESTABLISHES STAINLESS STEEL DIVN.

Establishment of a separate stainless steel sales division is announced by the American Steel & Wire Co., U. S. Steel Subsidiary. The new division, named the Stainless Steel Products Sales Division, is under the direction of Banks E. Eudy as manager, a pioneer in the field. C. Richard Horwedel, authority on stainless and other high alloy metals is assistant manager.

The company recently placed in operation at Waukegan, Ill., an entirely new stainless mill, where the company's production of stainess steel wire of all gauges will be concentrated. Stainless steel strip production continues to be centered at Cuyahoga Works in Cleveland.

REDUCTIONS ON STAINLESS ANNOUNCED BY ALLEGHENY LUDLUM

Revisions downward in some price extras of stainless steel products manufactured by Allegheny Ludlum Steel Corporation, Pittsburgh, Pa., were recently announced by Russell M. Allen, vice president in charge of sales.

Quantity extras were reduced from 5¾¢ to 1¾¢ per pound, depending upon size of the individual order. This reduction included all grades of all products except stainless tubes and castings. Percentage of reduction of total price, Mr. Allen pointed out, depended upon the size of the individual order.

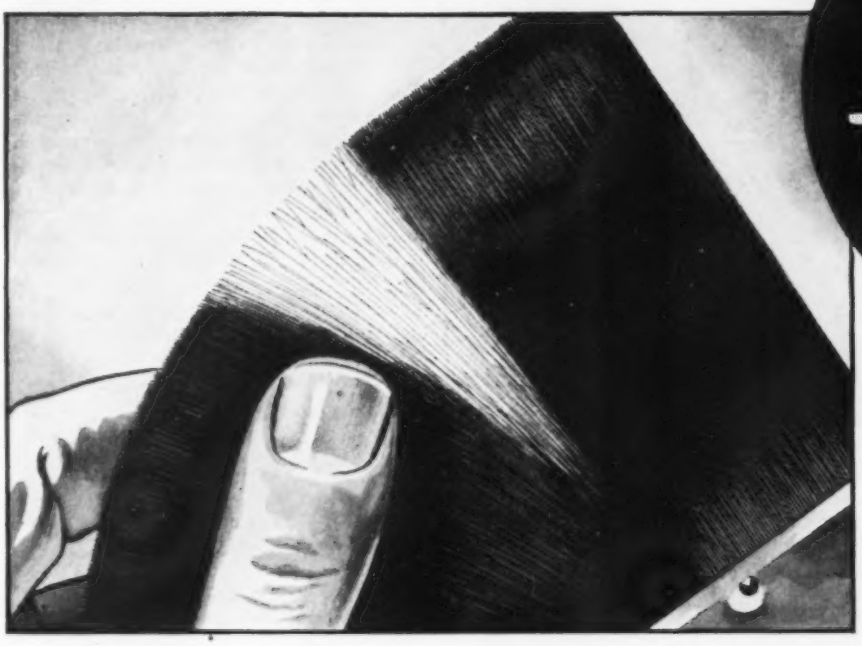
Stainless steel sheet gauge extras also were reduced in some instances. Gauges 23 to 26 inclusive were reduced by 2¢ per pound and gauges 21 and 22 were reduced 1¢ per pound. Simultaneously, a slight reduction in packaging extras for stainless steel strip was announced.

(*Please turn to page* 334)

Test your Brush I.Q.

No. 2 in a Series

What determines the bristle's resilience?



The bristle's resilience or elasticity is due to its taper, for bristle is thicker at the root end than at the flag. This natural taper gives the bristles springiness, as demonstrated on a larger scale in a fisherman's fly rod.

This springiness, or elasticity, is necessary in a good painting tool. Pittsburgh combines various lengths and kinds of bristle to give the ideal elasticity for each length and type of brush.

PITTSBURGH—
Produces the Most Complete Brush Line in the Industry!

Painting . . . Purchasing agents from coast to coast depend on Pittsburgh's complete line of brushes for every use. It's a reliable source for Gold Stripe, Neoceta, and Nylon. And in these days of rising costs, you'll welcome the Pittsburgh Neoceta brush as a *real* economy in painting tools.

Maintenance . . . When it comes to sweeps, dusters and scrubs—there's none better than Pittsburgh's "Lightning Line".

Industrial . . . Pittsburgh maintains a crew of skilled engineers to quickly and effectively solve your power-driven brush problems. You'll find their assistance valuable in developing any type of power-driven brush to your particular specifications. Write or call Pittsburgh Plate Glass Company, Brush Division, Baltimore 29, Maryland.

One Source—One Quality—One Name to Remember—PITTSBURGH!

BRUSHES FOR INDUSTRY

BRUSHES · PAINT · GLASS · CHEMICALS · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

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$5.07 saved a contract ...and a man's business

Special switches were needed to complete an electrical instrument contract. Late delivery of finished items would kill chances of future orders and lay off men. Switches were 1100 miles away, but Air Express delivered the 15-lb. package at 3 A.M. — 8 hours after pick-up. Cost, only $5.07. Air Express now used regularly. Keeps down inventory, improves customer service by early delivery.

Low as $5.07 was, remember Air Express rate *included* door-to-door service, receipt for shipment and more protection. It's the world's fastest shipping service that *every* business uses with profit.

World's finest Scheduled Airline fleet carries Air Express. 24-hour service — speeds up to 5 miles a minute. Direct to over 1000 airport cities; air-rail for 22,000 off-airline offices.

FACTS on low Air Express rates:

17-lb. carton of hearing aids goes 900 miles for $4.70.
12 lbs. of table delicacies goes 600 miles for $2.53.
(Same day delivery in both cases if you *ship early.*)

Only Air Express gives you all these advantages: Special pick-up and delivery *at no extra cost. You get a receipt for every shipment* and delivery is proved by signature of consignee. One-carrier responsibility. Assured protection, too—valuation coverage up to $50 without extra charge. Practically no limitation on size or weight. For fast shipping action, phone Air Express Division, Railway Express Agency. And specify "Air Express delivery" on orders.

SPECIFY AIR EXPRESS
GETS THERE FIRST

Rates include special pick-up and delivery door to door in principal towns and cities

AIR EXPRESS, A SERVICE OF RAILWAY EXPRESS AGENCY AND THE
SCHEDULED AIRLINES OF THE U.S.

RYERSON STARTS NEW BUILDING AT CHICAGO PLANT

Joseph T. Ryerson & Son, Inc., pioneer Chicago steel firm, have begun construction of a large brick and steel addition to their Chicago plant which will provide approximately 118,000 square feet of modern plant and office space. Completion is scheduled for November, 1949. This is the initial move in a series of planned additions and improvements which, according to President Everett D. Graff, will ultimately result in large-scale expansion and modernization of their entire Chicago property. The company operates what is known as a steel-service business, supplying bars, plates, structurals, sheets, strip, tubing and other steels from stock. In recent years alloy and stainless steels have become important products. Their Chicago plant is said to be the largest of its kind in the world.

The new building will provide over 4 acres of plant and office space.

The new building, an L-shaped structure, will be erected at 15th and Rockwell Sts., becoming a part of what is known as the North Unit of their three block plant, and extending East along 15th Street from Rockwell Street to the Pennsylvania Railroad, a distance of 470 feet. Construction includes a two-story office building, an integral part of the plant addition, which forms part of the new structure of 200 feet on Rockwell Street, and which will provide about 12,000 square feet of office space.

The first building of the present Chicago plant, at 16th and Rockwell Streets, was erected in 1902. Six years later the entire operations were moved to this location. In subsequent years this plant has undergone many additions and improvements, which have made it one of the largest and best equipped steel service plants in the world. Including the addition now under way, approximately one-million square feet of floor space are occupied. Total ground area in the Chicago property is about 24 acres. When the new building is completed, the overall plant will have a capacity of from 75,000 to 100,000 tons of steel—which include practically every kind, shape, finish and size.

STEELMAKING CAPACITY NOW 96,000,000 TONS PER YEAR

Steelmaking capacity of the steel industry, at 96,000,000 tons per year, is now greater than ever before in war or peace, and further large expansion is planned during the next two years, it was announced recently by Walter S. Tower, president, American Iron and Steel Institute.

By pushing their programs of expansion

(*Please turn to page* 336)

SEYMOUR BEST SELLERS WORTH READING ABOUT

Here are the quick facts on the popular, industry-specified Seymour alloys. To product designers and production engineers interested in reducing costs, improving quality, increasing product acceptance, complete details on these widely used alloys are available in the NEW catalogs on Seymour Nickel Silver and Seymour Phosphor Bronze. Write for yours *today*.

SEYMOUR ALLOY NO.	COMPOSITION %					USES
NICKEL SILVER	NICKEL	COPPER	ZINC	LEAD	TIN	
• 18A1	18	65	17			Seymour Nickel Silver is used for flatware, hollowware, name plates, surgical appliances, drafting instruments, camera parts, springs, electrical resistance units, optical goods, television parts, slide fasteners, costume jewelry, dental instruments, architectural trim, core bars, screws, keys, screw machine and milled products, orthopedic appliances, telephone assemblies, diaphragms, ornamentation and hundreds of other uses.
• 18A4	18	55	27			
• 18X1	18	62	19	1		
• 15A	15	64	21			
• 15X1	15	60	24	1		
• 15X2	15	60	23	2		
• 12A1	12	66	22			
• 12X1	12	60	27	1		
• 12X2	12	60	26	2		
• 10A1	10	67	23			
• 10X1	10	60	29	1		
• 10X2	10	60	28	2		
• 5A1	5	68	27			
PHOSPHOR BRONZE						
• 950		95			5	Seymour Phosphor Bronze is used for springs, diaphragms, fuse clips, lock washers, thermostatic controls, studs, microphone assemblies, electrical devices, nuts, bolts, gears, bushings, pump parts, pinions, plugs, etc.
• 494		94		1	5	
• 928		92			8	
• 910		90			10	
• 444		88	4	4	4	

OTHER SEYMOUR PRODUCTS

Seymour Nickel Anodes are produced under accurate pyrometric control. Special grain structure reduces sludge and loose nickel to a minimum. Seymour Anodes, in all shapes to meet rigid specifications, are also available in copper, brass, bronze and zinc.

Seymour Bright Nickel produces bright deposits over copper and brass and direct on steel without the usual coloring and buffing.

Seymour Phosphor Bronze Welding Rods are made specifically for high strength, ductile welds. Available in standard lengths, Grades A, C and D.

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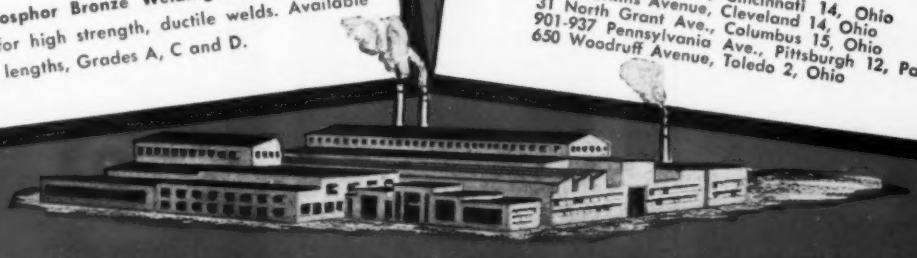
3231 Fredonia Ave., Cincinnati 14, Ohio
3700 Perkins Avenue, Cleveland 14, Ohio
31 North Grant Ave., Columbus 15, Ohio
901-937 Pennsylvania Ave., Pittsburgh 12, Pa.
650 Woodruff Avenue, Toledo 2, Ohio



THE SEYMOUR MANUFACTURING COMPANY, SEYMOUR, CONNECTICUT

Want Additional Product Information? See Page 19.

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. . . with Amgears co-ordinated engineering and manufacturing know-how

We have the designing engineers viewpoint on the importance of strict adherence to blueprints and specifications. The same personal care is given to the production of gears and gear assemblies in our plant that the designer gives to the engineering of the job.

Specifications are studied by our engineers to determine the most efficient economical manufacturing procedure. Sometimes modifications are suggested to achieve greater production economy, but when a contract is accepted the specifications are strictly followed in production.

★ *A qualified sales engineer representing Amgears, Inc., is located near you for personal service* ★ *We invite correspondence on your particular gear problems.*

★ ***We specialize*** . . . in all types of gears and gear assemblies for original equipment.

Gears for construction equipment.
Automotive and tractor gears.
Fine pitch instrument gears.
Gears for farm implements.
Special gears for high speed operation, with shaved or ground teeth.
Miter and bevel gears for mining machinery.
Helical shaved or ground tooth pump gears.
Aircraft engine and airframe gears.

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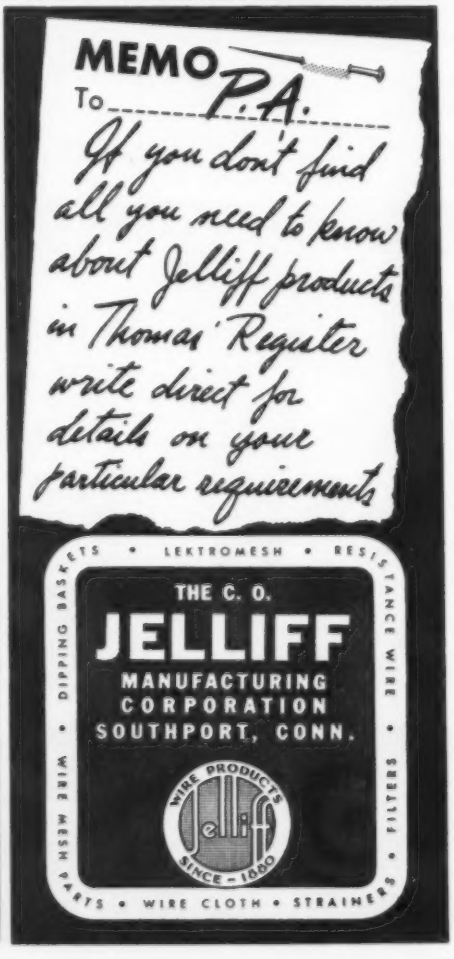
A Division of the B. F. Goodrich Company


MEMO
To P.A.
If you don't find all you need to know about Jelliff products in Thomas' Register write direct for details on your particular requirements
THE C. O. JELLIFF MANUFACTURING CORPORATION SOUTHPORT, CONN.
WIRE PRODUCTS
SINCE 1880
DIPPING BASKETS • LEKTROMESH • RESISTANCE WIRE
WIRE MESH PARTS • WIRE CLOTH • STRAINERS • FILTERS

(*Continued from page* 334)

and improvement, companies of the industry increased the total ingot capacity by 1,800,000 tons during 1948, Mr. Tower said. The increase in 1948 was substantially higher than expected under schedules reported a year ago.

Furnaces of the industry, operating fully, can now pour more than 180 tons of raw steel every minute for a full year, Mr. Tower pointed out. The new record capacity is 18 per cent higher than the capacity of 1940, compared with a population increase of 11 per cent during the same period of time.

While the 1948 additions were being made, several new programs of construction and improvement were launched, Mr. Tower said. Cost of postwar expansion exceeds two billion dollars.

Schedules now call for the addition of 2,200,000 tons in 1949 and 500,000 tons in 1950. Thus, a total capacity of more than 98,000,000 tons by the end of 1950 is indicated, barring any enforced retirement of facilities which cannot be foreseen or estimated at this time.

To support the great increase in steelmaking capacity, other producing facilities in the industry are likewise being expanded and improved. Blast furnace capacity was increased sharply during 1948 and as of January 1, 1949 is rated at 70,500,000 tons a year, Mr. Tower said. More additions are planned over the next two years in blast furnace, coke and other departments.

WESTINGHOUSE ANNOUNCES PRICE CHANGES IN APPARATUS LINES

Westinghouse Electric Corporation recently announced a reduction in ceiling on adjustable prices on apparatus lines from 20 percent to 10 percent primarily because of much lower backlogs on most lines of products, effective December 30, 1948, according to a statement by J. H. Jewell, Apparatus Sales Manager for the Company.

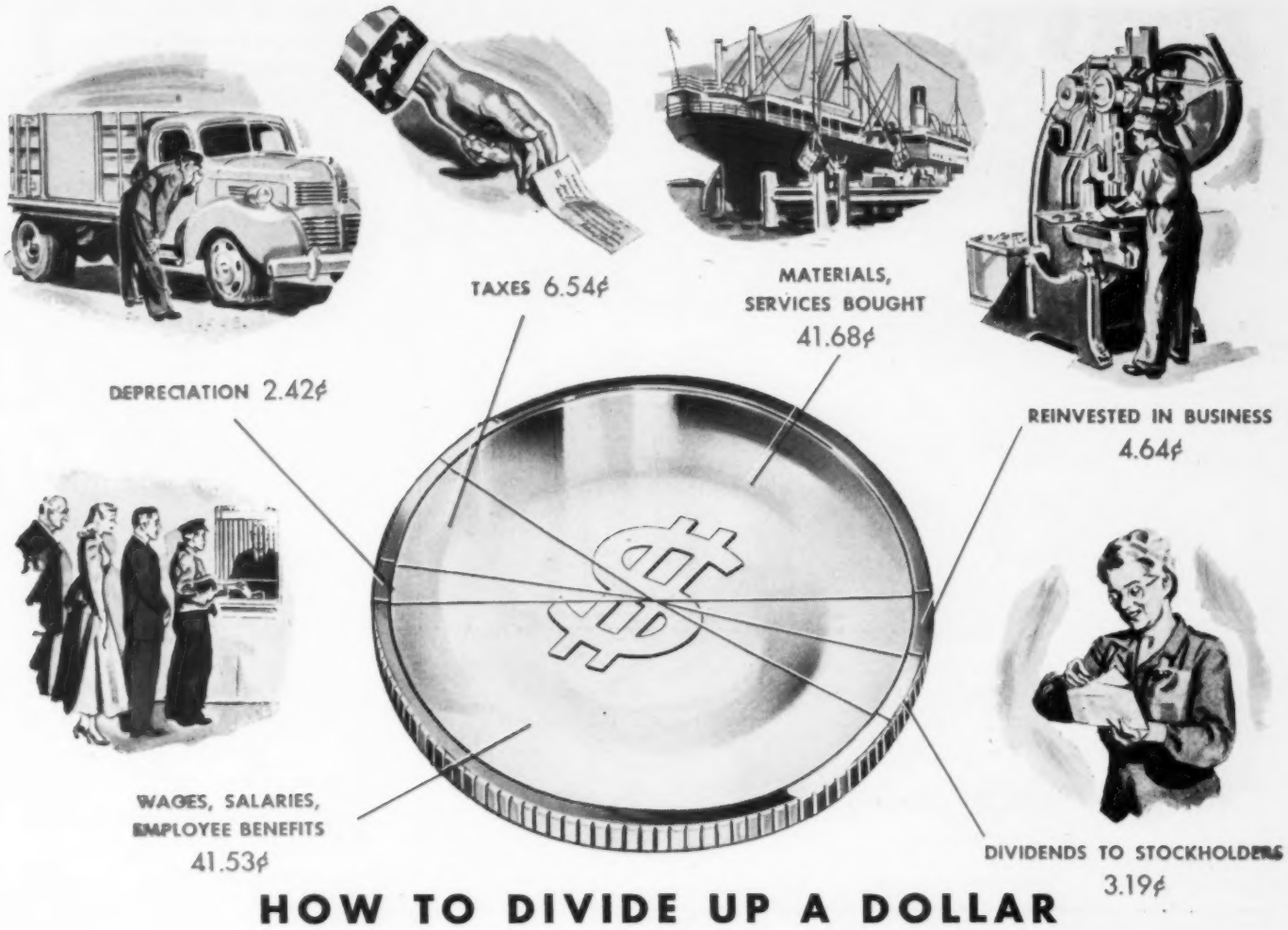
This redution in ceiling on apparatus lines applies to all apparatus with the exception of waterwheel generators, frequency changers, synchronous condensers, stokers, and power transformers above 15,000 kva.

Because of continuing increases in manufacturing costs, price increases are also announced at this time on certain apparatus lines: steam condensers, feed-water heaters, and evaporators 5 percent; a-c motors over 50 hp and integral hp d-c motors approximately 5 percent; turbine generators, 20,000 kw and above, are increased 10 percent.

Other lines are being analyzed and it is hoped that additional price increases will not be necessary at this time.

With the price adjustments and the ceiling reduction, which more closely approaches a firm price policy purchasers should be able to plan more definitely even though risk to Westinghouse under present conditions is increased, Mr. Jewell states.

(*Please turn to page* 338)



HOW TO DIVIDE UP A DOLLAR

. . . the American Way

It may interest you to know the mistaken notions most folks have about the profits of American companies.

They tell interviewers that they *think* such companies are entitled to make 12 to 15 cents on every dollar of income, as a fair return. Yet, they add, it's their guess that manufacturers *actually do* make about 25 cents!

The facts are that in normal years American companies average about *nine cents* profit per income dollar.

Take Aluminum Company of America in 1947, for example. Out of each dollar received that year by Alcoa and its subsidiaries, the net profit amounted to *less than eight cents*. We show above where the rest of that dollar went. Nearly half of it in wages, salaries, and employe benefits, to Alcoans. Almost another half for materials and services we bought. Over six and a half cents for taxes.

The dollars-and-cents story of Aluminum Company of America represents the kind of facts you'll get from any typical American enterprise. Facts that show a fair return for a good product.

Within the heart of America are those who would like to confuse and mislead you. It pays to ask straight questions, where you can get straight answers.

ALCOA

Aluminum Company of America

Want Additional Product Information? See Page 19.

ERIE SPECIAL BOLTING
FOR HEAVY MACHINERY

FOR over 30 years ERIE has specialized in the manufacture of *high quality bolting*. We use the very latest equipment for heat treating, machining, grinding and threading. We are certain that we can produce better bolting at a saving to you because we are specialists — send us your bolting specification for our estimate.

for EXCAVATING EQUIPMENT

A DEPENDABLE SOURCE OF HIGH QUALITY BOLTING FOR RAILROADS, REFINERIES, DIESELS, FARM MACHINERY, EXCAVATING EQUIPMENT AND ALL TYPES OF HEAVY MACHINERY.

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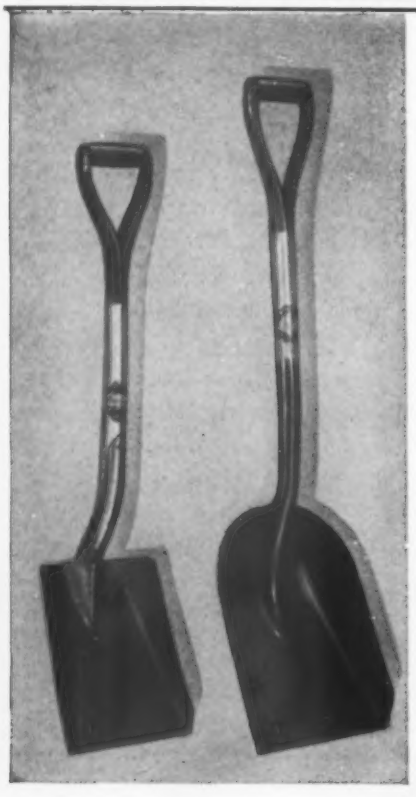

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To THESE
GOOD BUYS
in
SHOVELS

Get acquainted — right now — with Ingersoll shovels. The *only* shovels, spades and scoops made of TEMCROSS Tillage Steel — with blade edges GUARANTEED NOT TO SPLIT. Electrically heat-treated for springy ruggedness. Smooth polished hardwood handles. Specify Ingersoll — "A Borg-Warner Product" — for *all* your shovel needs.

INGERSOLL STEEL DIVISION
Borg-Warner Corporation
New Castle, Indiana

Plants: New Castle, Ind.; Chicago, Ill.; Kalamazoo, Mich.

All blade finishes now black except Molders' Shovels which may be furnished with either face or back polished.

INGERSOLL Shovels

INSTRUMENT USE IN INDUSTRY TO EXPAND IN 1949

Industrial instrumentation is fast emerging as one of the most important influences on improved living standards, better working conditions, and ultimately lower prices, Henry F. Dever, president of Brown Instruments division of Minneapolis-Honeywell Regulator Company, said recently.

In a statement charting the industry's 1948 expansion and its prospects for 1949, he said its unusual growth is "due to the ability of industrial instruments to improve manufacturing processes, increase quality of product and eliminate or reduce spoilage—all of which improve efficiency and lower costs." He also cited the industry's role as a bulwark of national security.

"The ratio of instrumentation to overall plant expansion," he declared, "has increased four-fold since 1939. What could be clearer evidence of the worth of industrial instruments to industry? Measuring and controlling devices for all purposes experienced a sales and production increase in 1948 averaging about 11 per cent over 1947.

"Backlog orders, extending from a few weeks to several months, plus anticipated business predicted upon a sustained favorable outlook, indicate that this same rate of expansion will carry through 1949 and possibly into 1950."

The two world wars, Dever pointed out, have been largely responsible for the spectacular domestic growth of an industry that scarcely existed in the United States prior to the 1914-1918 war. By 1920 a total of some $30 million of instruments were made in the U. S. Production rose to $150 million worth in 1940. Last year, he estimated, some 1,200 companies turned out about 20,000 types of instruments and instrument-equipped apparatus having a sales value of more than $2 billion.

Almost no finished product, whether for consumer or industry use, now reaches the ultimate buyer untouched by new electronic and other automatic controlling devices, according to the Brown Instruments president. Practically every modern industry has become dependent on such devices as flow meters, pressure gauges, draft gauges, resistance thermometers, carbon dioxide recorders, reducing valves and combustion controls.

"We feel that the industrial necessity for greater production efficiency is sustaining the current demand for instruments," Dever said. These versatile manufacturing aids will help industry to meet (1) the necessity of offsetting higher material, wage, tax, maintenance and other costs; (2) the necessity for meeting new and increasingly intricate processing requirements that modern engineering and research are developing, and (3) a rising demand for products to replace those which are becoming difficult to make because of dwindling natural resources.

"In certain industries, notably paper, textile, chemical and food," Dever related, "installation of industrial instru-

(*Please turn to page* 340)

1. Is this an au-to-mo-bile?
Yes, this is an au-to-mo-bile.
It is a fine au-to-mo-bile and

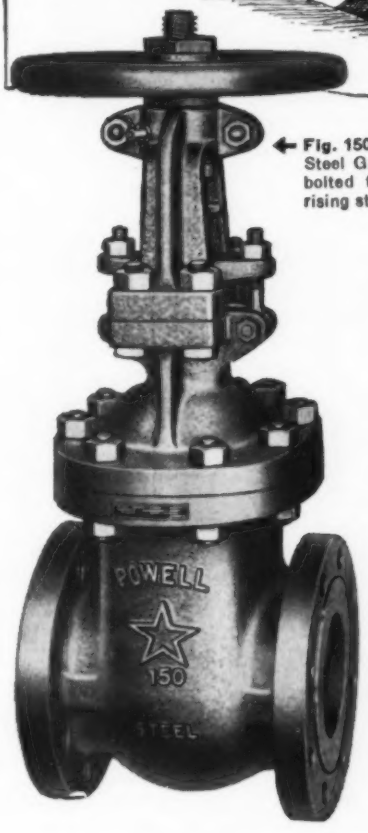
POWELL VALVES

helped to make every part of it.

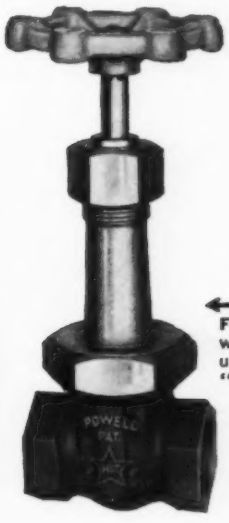
American Industry has gone a long way since McGuffey compiled his First Reader in 1836. But Powell Valves have matched every step in its progress.

Literally, Powell Valves help to make everything that goes into the modern automobile. Because, whether it be motor, transmission, chassis, body, plastics, finishes, tires, anti-freeze, battery, gasoline or any other processed item, there are Powell Valves exactly suited to control the flow of all media used in their production.

This automobile merely illustrates the completeness of the Powell Line. The important point is that, no matter what *your* product may be, there are Powell Valves especially adapted for each and every one of your flow control services.



← **Fig. 1503** — Class 150-pound Cast Steel Gate Valve with flanged ends, bolted flanged yoke, outside screw rising stem and tapered solid wedge.



← **Fig. 375**—200-pound Bronze Gate Valve with screwed ends, inside screw rising stem, union bonnet and renewable wear-resisting "Powellium" nickel-bronze disc.

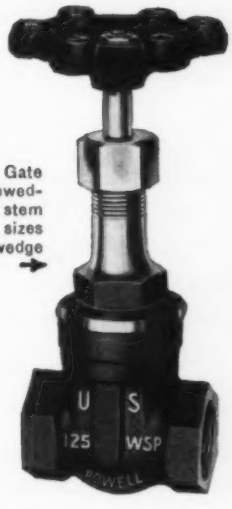
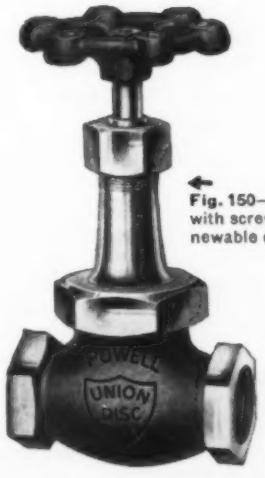


Fig. 500—125-pound Bronze Gate Valve with screwed ends, screwed-in bonnet, inside screw rising stem and tapered solid wedge in sizes ¼" to ¾", inclusive; double wedge in sizes 1" to 3", inclusive. →



← **Fig. 150**—150-pound Bronze Globe Valve with screwed ends, union bonnet and renewable composition disc.

Fig. 241—Large 125-pound Iron Body Bronze Mounted Globe Valve. Made in sizes 2" to 16", inclusive. Has outside screw rising stem, bolted flanged yoke and regrindable, renewable bronze seat and disc.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES

Quality Meehanite®

BAR STOCK

by

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● In four grades of Brake Shoe Meehanite ® metal . . . in 35 different diameters ranging from ¾" to 12" . . . in lengths of 14", 16" or 24" according to the diameter, *Bar Stock by Brake Shoe* is proving a practical answer to many a production problem. Its availability is important in many cases, its uniformity in all.

Bar Stock, while a standard item in one sense, is a *high*-standard item when supplied by American Brake Shoe Company. You can be sure of its structural soundness and physical properties.

Bar Stock by Brake Shoe includes grades of Meehanite metal ranging from 30,000 to 50,000 lbs. tensile strength. Send for price list.

AMERICAN Brake Shoe COMPANY

BRAKE SHOE AND CASTINGS DIVISION

230 PARK AVENUE, NEW YORK 17, N. Y.

(*Continued from page* 338)

ments have achieved spectacular results in cost reduction."

As examples, Dever cited the case of a Rhode Island textile processor who has obtained, within a year, a 100 per cent return on his original investment in instrumentation and modernized equipment. An Alabama mill, Dever reported, has increased its production 25 per cent and its weaving efficiency two per cent through electronic controls, while a paper maker is saving from five to nine per cent of the sulphite used for production of newsprint and other paper products.

"It is impossible to estimate accurately," Dever said, "the contribution of automatic processing to lower costs, but the effects of this greater efficiency throughout our economy will become more apparent over the near future."

PUSHBROOM WITH POLYSTYRENE PLASTIC BRISTLES

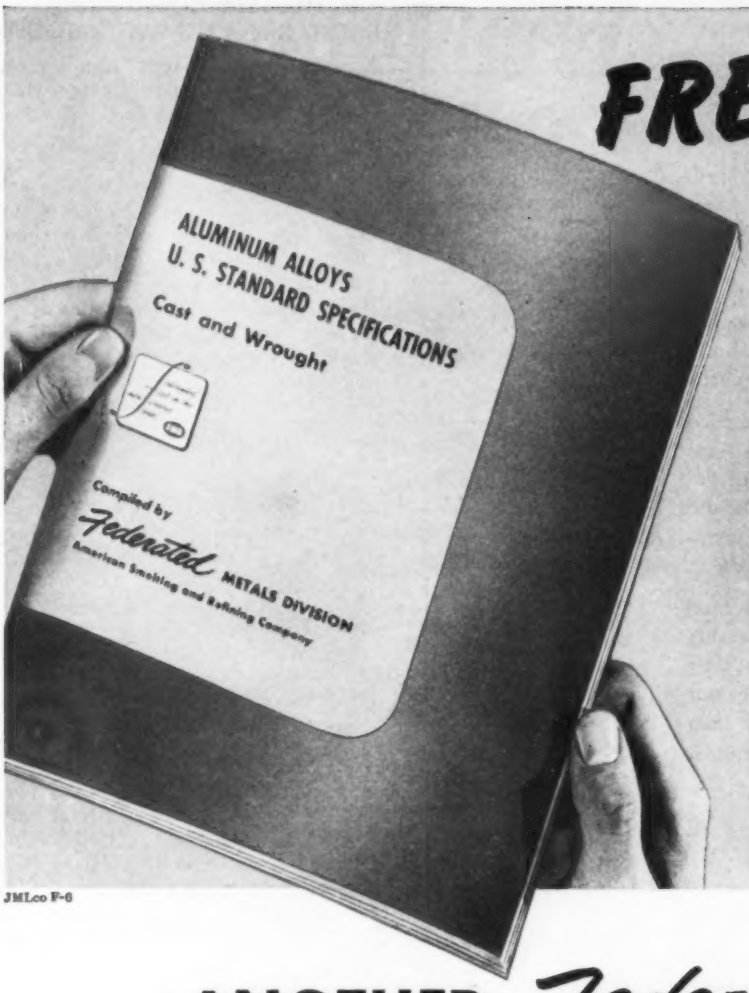
A new pushbroom that is not affected by water or mild solutions of acids and alkalis, and which is said to set a new standard for durability is announced by the Modglin Company, Inc., 3235 San Fernando Road, Los Angeles, Calif. Named the "Perma-Brush", this new pushbroom employs "Electrene" (polystyrene plastic) bristles. The bristles are set in four continuous rows rather than in tufts, and in normal sweeping all four rows of bristles are in contact with the surface being swept. The maker states that the broom does not become soggy, water-logged or matted. It is easily washed in warm water, dries quickly and doesn't lose its shape. The broom is available in two sizes—18" and 24". The bristles, 3¾", are set in a hard wood block to which the handle is connected by a curved metal ferrule which securely holds the handle.

METAL CLADS STAINLESS STEEL AND COPPER

Rosslyn Metal, in which a copper center is clad inseparably to two sheets of stainless steel, is said to provide extreme corrosion resistance with maximum thermal conductivity. Manufactured by the American Cladmetals Company, Rosslyn Farms, Carnegie, Pa., the metal is being used in food processing equipment, replacing heavy, solid copper equipment plated with expensive, hand-processed deposits of tin.

The material can be highly polished, and easily fabricated, and transmits heat or cold quickly and evenly. It can be stamped, drawn, bent, spun, polished, fabricated or welded. It is available in standard mill size sheets in thicknesses from .015" to .200".

The stainless steel and copper are bonded together by the Kinney process, in which no soldering, plating or adhesives are used. The process can also be applied to other dissimilar metals.



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FREE Handbook of Aluminum Specifications

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ANOTHER *Federated* FIRST!

For your convenience . . . here in one 24-page volume . . . are all the latest specifications of the aluminum industry—ASTM, AMS, SAE, Federal, Army, Navy and others—as they pertain to Sand Castings, Permanent Mold Castings, Die Castings, Wrought Alloys and Ingots.

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This Aluminum Alloys Specifications manual is a reference book . . . *a must* for your top desk drawer. It's another Federated first . . . another Federated service. Mail the coupon today for your free copy.

Federated Metals produces aluminum alloys of all specifications, as well as copper-base alloys, bearing metals, solders, magnesium alloys, fabricated lead products, zinc dust, deoxidizers and hardeners. 24 offices across the nation.

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Federated METALS

Division of American Smelting and Refining Company, 120 Broadway, New York 5, N. Y.

HāDees EMBLEM OF DEPENDABILITY

HOT WATER HEATERS

Quick-starting points, strong hardened threads, rugged holding power — these Elco screw features mean assurance against lost assembly time due to defective fasteners. And in high volume production, such as these hot water car heaters, this dependability speeds production and lowers costs.

After the assembly job is done, Elco service carries on, too. For these strong hardened threads stay tight and rattle-free longer, permit removal and replacement, without danger of stripping, damaging or reducing the fit.

These are good reasons why Elco screws are used in so many assembly operations — good reasons, too, why they will serve you better. Why not write today and inquire about Elco screws to meet your requirements.

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Dependability features ELCO screws

ELCO Screws

ELCO TOOL AND SCREW CORPORATION

1912 BROADWAY ROCKFORD, ILLINOIS

WOOD SCREWS • MACHINE SCREWS • MACHINE SCREW NUTS
DRIVE SCREWS • CAP SCREWS • LAG SCREWS • SPECIAL SCREWS
TAPPING SCREWS • STOVE BOLTS • PIPE PLUGS

BOTTLE-TYPE COMPARTMENT ELECTRIC DRINKING-WATER COOLER

A sanitary bottle-type compartment electric drinking water cooler which provides properly cooled drinking water, cold storage space, and frozen ice cubes is being introduced by The Ebco Manufacturing Co., Columbus, Ohio. The unit provides different degrees of cold for water cooling, cold storage and freezing, which the maker states does not require an "intricate system of tricky valves." The cold storage compartment has ample space for quart milk bottles or 32-oz. bottles to stand upright.

LARGE PIPE BENDS

The illustration shows giant 24-inch bends fabricated by the Los Angeles plant of the Midwest Piping & Supply Company, which were made for the Gulf Oil Corporation for use at its oil-loading dock facilities at Kuwait, Arabia. The bends are fabricated from pipe rolled from half-inch steel plate. These are part of a lot of 56, being prepared for shipment.

ALUMINUM MOVIES AVAILABLE FROM REYNOLDS

Reynolds Metals, 831 South Twelfth St., Louisville 1, Ky., announces the availability of the following 16-mm moving pictures on aluminum, without charge:

"Pigs & Progress"—a 35 minute, full color sound movie showing production of aluminum from raw bauxite to finished aluminum products. It contains much information on fabrication, application and use of aluminum.

"Roofing Unlimited"—a 17 minute picture on 0.004-inch embossed aluminum built-up roofing, showing application methods, etc. It is color and sound.

"The Benson Barrel"—a 20 minute black and white sound picture on the Benson beer barrel made from Reynolds aluminum. It features an excellent production sequence showing deep drawing of aluminum and related operations.

"The Aluminum Boat"—an eight minute, color, silent movie on 12 foot aluminum boat, showing construction and operation features.

"Portable Overhead Irrigation"—20 minute black and white silent picture on portable overhead sprinkler type irrigation systems.

"Lifetime Aluminum Gutters and Downspouts"—an 18 minute, color, sound picture covering erection methods and advantages of aluminum gutters and downspouts.

Put this **WINNING COMBINATION** *to work for you!*

Hines EXPERT ENGINEERS

Hines MODERN MACHINES

Hines LUMBER SUPPLY

PROTECTED QUALITY — THE NAME OF FAME — HINES — IN LUMBER — FROM TREE TO YOU

Which one of the three—engineering, production, lumber procurement—is bothering you? Hines is ready and able to solve any one of your problems as far as wood is concerned —or take over the complete job of wood parts production. We are doing a money saving job for many large manufacturers and are ready to go to work for you. If you are interested in cutting costs, phone, write or wire today!

EDWARD HINES LUMBER CO.

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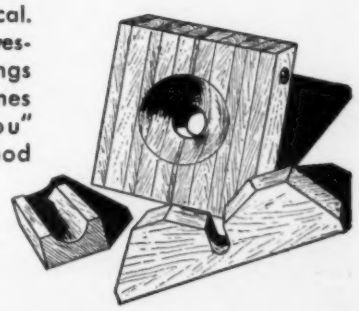
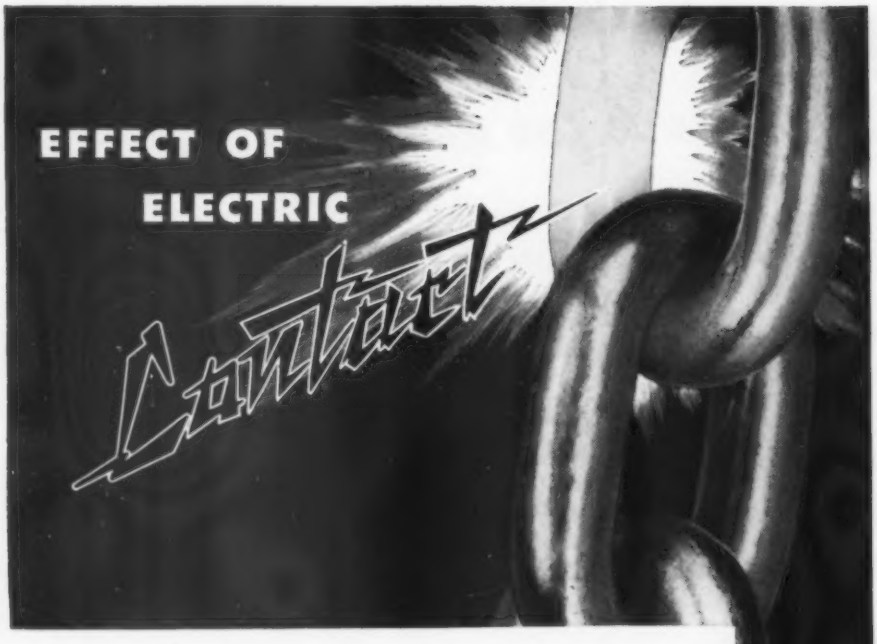
2431 So. Wolcott Ave., Chicago 8, Illinois

WOOD PARTS IN ALL SHAPES AND SIZES

• In many cases wood is better and more economical. It will pay to investigate the savings effected by Hines "forest to you" service on wood parts.





POWERFUL STEEL FINGERS form wire into links. Then *contact* with electric power makes a strong, permanent weld—and the link is joined into another good AMERICAN CHAIN. • Most types of chain are made on automatic or semi-automatic machines. But the high quality of AMERICAN CHAIN is maintained by systematic inspections and tests made by men of long experience. Even though machines have taken the place of muscles, chain-making is still a highly specialized craft. And AMERICAN chainmakers are proud of their craftsmanship.

BUY AMERICAN
—the COMPLETE Chain Line

ACCO

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

F. O. B. Mill Steel Pricing

(*Continued from page 96*)

ernment. First, it would be necessary to remove the income tax on corporations and place the tax on dividends. Only in this way would it be possible for losses in bad years to be offset by profits in good years, and only if this is done can a producer enter into real price competition without facing a "heads you win, tails I lose" proposition. In addition, it would be necessary to eliminate the tax provisions which put a penalty on accumulation of large cash reserves. If industries are expected to take large losses during periods of depressed business, they must be allowed to accumulate large cash reserves during periods of prosperity. A third consideration would be the reduction of labor's bargaining power so that profits of the employing concern would not determine wage. rates Unless these rates are determined only by the relative market value of that labor in other markets and other industries, the steel industry will always be a very disturbing factor in the wage structure of the country during periods of good business, because by nature the steel industry is a "prince or pauper" industry and open price competition would make it many times as subject to this characteristic.

Inflation and Deflation

If inflation is caused by an excess of money with relation to goods available, then the best way to stop inflation is to take money out of circulation. One effective way of doing this would be to encourage industry to build up large cash reserves by changing the tax basis from income to dividends, and by removing the penalties for excessive accumulation of cash reserves. Likewise, if deflation exists when the supply of money is less than the amount of goods available, the most potent counter deflation force would be to have large industries such as steel sell their product below their average cost and meet the deficit by dipping into the reserves accumulated during periods of inflation. All of these things would be in accordance with the tradition of a free market and free competition which has characterized periods of great development in this country.

But we must conclude that the rules of the game have now been set up in such a manner that the free price competition promoted by f.o.b. pricing are probably not to the best interest of the steel industry or the steel consumer.

SHERARDUCT—
THE *fortified* RIGID STEEL CONDUIT

SHERARDUCT is *fortified* against rust and corrosion by a zinc coating driven into the pores of all surfaces inside, outside and *threads*. This coating is alloyed with the steel by the Sherardizing Process, and is an integral part of the tube itself.

SHERARDUCT is still further protected by the smooth "Shera-Solution" coating, baked on for added endurance against acids and other corrosive agents.

SHERARDUCT will not crack or split! Bending does not harm the fortified protection, because the coating is an integral part of the steel itself!

Specify SHERARDUCT—the *fortified*, full weight, threaded, rigid steel conduit. Sold through leading electrical wholesalers.

NATIONAL ELECTRIC PRODUCTS
WIRING SYSTEMS
WIRES AND CABLES

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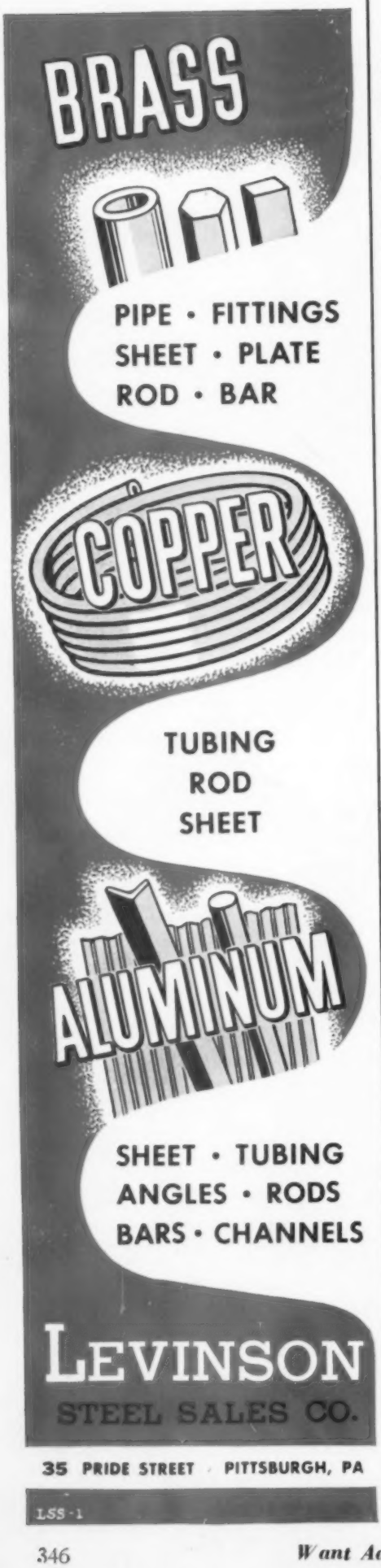


Production and the Purchasing Agent

(*Continued from page* 89)

James Forrestal, that United States is finding out that in many materials it is definitely a "have-not" nation. (*Sat. Eve. Post*, 221:22:15).

As a forerunner for things to come is the case of the first automatic radio factory. (*Fortune*, 38:2:90). This factory, which replaces production personnel with electronic circuit making equipment, continues to need procurement services. The productivity claimed for this factory is based upon the basic claim that 50 people using the equipment can easily out-produce 1,500 production personnel using orthodox methods. Yet its present problem is lack of materials and its effectiveness depends directly upon the productivity of procurement activities. To date, no electronic device has been developed capable of handling a procurement program.

Productivity to the modern economist, consisting of the creation of time, place, and ownership utility, as well as form utility, truly incorporates the functions of the purchasing agent.

* * *

Canada's Mineral Treasure Chest

(*Continued from page* 115)

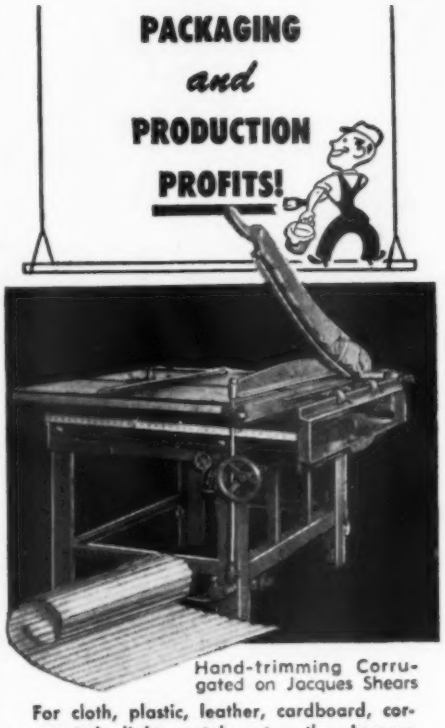
as a result of recent discoveries, and the indications are that, despite such handicaps as high transportation costs, those areas will receive increasing attention.

Ontario, however, is the premier mining province of the Dominion. Its mines have produced more than 4 billion dollars worth of minerals and mineral products since 1891.

Most of the mineral wealth of Ontario has come from the nickel-copper mines of Sudbury, which started producing in 1887, the silver-cobalt mines of Cobalt whose production began in 1903, and the great gold mines of Porcupine and Kirkland Lake. Other gold camps, such as Red Lake, Pickle Lake and Little Long Lac, all in the northwestern section of Ontario, have also contributed handsomely to the aggregate of new wealth supplied by Ontario's mining industry. From a point of view of production value, mining is the second most important basic industry in the economy of the province. Agriculture is first.

Canada itself has long been the leading producer of nickel, and during the past twenty years it has also been a leading producer of copper, lead and zinc. Almost all of its

(*Please turn to page* 348)



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For cloth, plastic, leather, cardboard, corrugated, light metals, etc., the Jacques Shear is an all-shop tool of precision cutting. See your Industrial Supplier or write for Folder #28.

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EST. 1882
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THE RIGHT FASTENER FOR EACH TYPE BELT

WIREGRIP

WIREGRIP Belt Hooks with extra (patented) blue aligning cards—that assure better alignment with less hook loss—6 sizes.

STEELGRIP

STEELGRIP Flexible Lacing, applied with a hammer, clinches over and protects ends of belt. Boxed in long lengths.

PLATEGRIP

PLATEGRIP Fasteners for . . . Conveyor Belts. Make strong dust-tight joints in belts of any width. Spread tension uniformly. Allow natural troughing of belt. Operate smoothly over flat, crowned or take-up pulleys. Sizes for belts from ¼" to 1½" thick. Easily applied.

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SUREGRIP

Write for catalog.

ARMSTRONG-BRAY & CO.
The Belt Lacing People
5368 Northwest Hwy., Chicago, Illinois

INSUROK By RICHARDSON

dependable

names in

plastics

EXPERIENCE is just one of the factors that make the names of INSUROK and Richardson more significant to manufacturers whose products require laminated or molded plastics. Richardson customers benefit from this experience in many ways.

(1) Richardson experience with a wide variety of plastic materials helps you select the one that accomplishes your purpose most effectively, efficiently and economically.

(2) Richardson experience in the design and production of Laminated INSUROK and Molded INSUROK products has resulted in savings to scores of manufacturers.

(3) Richardson's many proven grades of Laminated INSUROK are available in sheet, rod or tube stock or in fabricated, punched or post-formed component parts for an endless variety of applications.

(4) INSUROK plastic products and Richardson services have played an important part in the development and refinement of many products.

It might be to our mutual advantage to know how these materials and services can work for you.

INSUROK is a registered trade-mark of The Richardson Company

The RICHARDSON COMPANY

GENERAL OFFICES: LOCKLAND, OHIO FOUNDED IN 1858

Sales Headquarters: MELROSE PARK, ILLINOIS

CLEVELAND · DETROIT · INDIANAPOLIS · MILWAUKEE · NEW BRUNSWICK, (N. J.) · NEW YORK · PHILADELPHIA · ROCHESTER · ST. LOUIS

Proved and Approved . . .

NEW CESCO
Cup-Type Goggles

FEATURING...

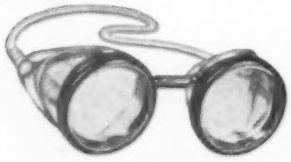
The COMFORT-KING Headband —holds goggles firmly with 30% less tension. Made of round molded rubber—it will not kink, curl or twist. No sharp edges. Instantly adjustable.

Job-Tested and Worker-Endorsed Where Constant Use Is Required

CESCO's new development in cup-type goggles increases wearer comfort and assures greater worker safety. These goggles have a lightweight feel, yet give sturdy protection. Individually contoured cups fit both left and right eye areas snugly and comfortably, without pressure. COMFORT-KING Headbands provide gentle, firm fit. Use of CESCO goggles will prove their advantages *to you.*

SEVERAL MODELS AVAILABLE

CESCO Chippers Goggles—No. 545-C with brown thermoplastic cups shown at top of column. No. 545-T with transparent cups shown below.



CESCO Welders Goggles—No. 545-W with 50 mm Cescoweld and cover lenses shown below.

Write for CATALOG—*New* CESCO *Catalog tells where to use, how to select protective equipment. Be sure to have this informative book.*

CHICAGO EYE SHIELD COMPANY
2320 Warren Boulevard • Chicago 12, Illinois
OFFICES IN: Boston, Buffalo, Cincinnati, Cleveland, Columbus, Detroit, East Orange, Houston, Los Angeles, Philadelphia, Pittsburgh, Seattle, St. Louis, St. Paul, Toledo, Tulsa, Montreal

CESCO
FOR SAFETY

Canada's Mineral Treasure Chest

(*Continued from page* 346)

nickel production is obtained from the properties of International Nickel Company of Canada Ltd., in the Sudbury area and from the Falconbridge Mine in that area.

As Canada is the source of from 80 to 85% of the world nickel supply, the outlook is governed mainly by the trend of business conditions in general. Present Canadian production capacity amounts to about 160,000 tons of the metal a year. Canada, however, uses less than 10% of its nickel output; the bulk of it is exported, mainly to the U. S. steel industry.

Close to 50% of Canada's copper production comes from the mines of International Nickel Company, the other chief sources of supply being the Noranda deposits in Quebec, the Flin Flon deposits in Manitoba and Saskatchewan, the Sherritt-Gordon Mines in Manitoba, and deposits of Britannia Mining and Smelting Co. and of Granby Consolidated in British Columbia.

Canada's production of copper during the past decade has ranged from a low of approximately 211,000 tons in 1936 to a record output of 328,000 tons in 1940. It declined to 238,000 tons in 1945.

Canada's production of zinc, including the metal content of concentrates, has ranged during the past decade from a low of 167,000 tons in 1936 to a record output of 305,000 tons in 1943. Production in 1945 amounted to 255,000 tons. About 75% of the total output is refined within Canada and the remainder, in the form of zinc concentrates, is shipped to plants in the United States for treatment. These concentrates come mainly from a mine in British Columbia, another in Manitoba, and from a few properties in Quebec.

In the past decade Canada has produced an average of approximately 207,000 tons of lead annually, with a peak output of 256,000 tons in 1942, and with an output of 173,000 tons in 1945. Practically all of the output is in the refined form. Domestic consumption during the past decade has averaged 20% of the output, the balance of it going mainly to the United Kingdom.

Other metals and ores produced in Canada include antimony, arsenic, bismuth, cadmium, calcium, chromite, cobalt, magnesium, mercury,

(*Please turn to page* 350)

"This'll give you a fit"....

B-RIGHT-ON
SOCKET SCREW
PRODUCTS

For a true fit every time, every way, you can rely on Brighton Socket Screws. Threads are precision-formed . . . meet all standards of accuracy and uniformity. Sockets are truly uniform . . . fit hand-in-glove with your wrench. B-Right-On Socket Set Screws set tight and stay tight.

First-quality materials . . . the most modern production methods . . . careful, critical inspection make all Brighton Socket Screw Products, tip-top in quality. Remember, you can do better with B-Right-On.

Brighton Screw & Mfg. Co.
1845 Reading Rd. Cincinnati 2, Ohio

BRIGHTON
Screw & Mfg. Co.

BIG NEWS!

A new booklet gives you

"Facts you should know about

HARDFACING ALLOYS"

Send for your free copy, TODAY!

This NEW, FREE booklet by Airco gives you authentic, understandable information for combating wear — caused by abrasion, impact, heat and corrosion.

Here, you will get facts essential for increasing the service life of *new* parts, and restoring *worn* parts for additional service. In part, this definitive, profusely illustrated booklet gives you:

- A handy, easy-to-understand guide for selecting the proper alloy for the proper wear retarding job.
- A Hardness Conversion Table.
- A Preheating Chart.
- A FULL description, and explanation, of Airco's NEW line of Hardfacing Alloys, with specification data, application technique, deposit hardness, color markings and deposit analysis.

If you are interested in increasing the service life of your equipment from 2 to 25 times, fill in and mail the coupon below for a copy of this NEW booklet. Send it to our nearest office or authorized dealer. On West Coast: Air Reduction Pacific Company. Represented Internationally by Airco Corporation (International).

ALSO — FOR ONLY $2.95 — YOU CAN GET A TRIAL ASSORTMENT OF AIRCO'S NEW LINE OF HARDFACING ALLOYS . . . A SPECIAL OFFER, AVAILABLE FOR A LIMITED TIME ONLY.

MAIL THIS COUPON TODAY FOR YOUR FREE COPY OF AIRCO'S DEFINITIVE HARDFACING BOOKLET

PR
Air Reduction, 60 East 42nd Street, New York 17, N. Y.

☐ Send me a copy of Airco's New Hardfacing booklet — at NO cost to me.

☐ Here is my check for $2.95 — send me the special package of Airco's Hardfacing Alloys.

Firm_____

Signed By_____

Address_____

City & State_____

AIRCO **AIR REDUCTION**

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

Seats every worker RIGHT — for every job!

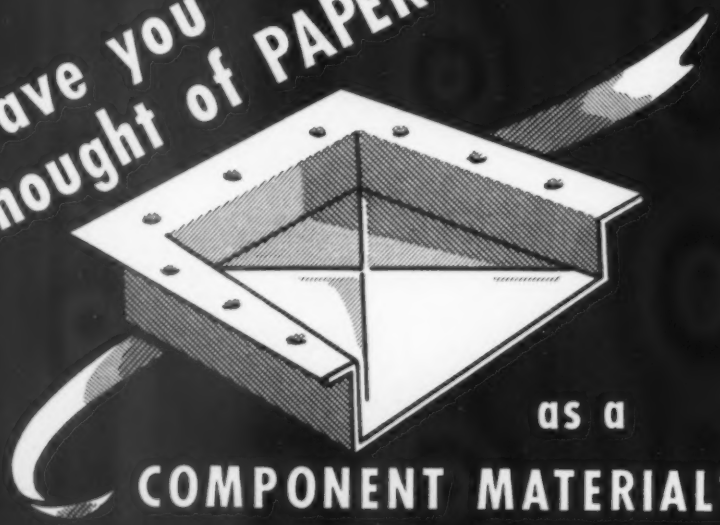
You are sure of "height that's right" for every worker when you choose Kewaunee Automatic Adjustable Chairs and Stools. That extra comfort feature has a definite effect on production by lessening fatigue. Split-second adjustment to the right height is made automatically by the worker. Lifting the seat locks it firmly at desired height. No fussing with screws, bolts or tools.

Kewaunee
Automatic Adjustable Chairs and Stools
4 height ranges
12-15", 15-20", 18-26", 24-35"
One piece reinforced base with casters or glides. Tonsion tested for strength. Adjustable foot-rest if desired.
Send for Chair or Stool to try 30 days or write for circular.

DEALERS — Some territories available. Write today.

KEWAUNEE MFG. CO.
5005 S. Center St. • Adrian, Mich.

Have you thought of PAPER as a COMPONENT MATERIAL?



Today special papers manufactured by Central are replacing metal, cloth and many other materials . . . improving product design . . . lowering costs . . . increasing production.

There may be a place in your product where an engineered paper by Central can improve its quality or lower its cost. Consult Central Paper Engineers about your problems . . . their expert advice is yours for the asking.

REG U.S. PAT. OFF.

CENTRAL PAPER COMPANY INC.
2446 Lakeshore Drive • Muskegon, Michigan
BRANCHES IN LEADING CITIES

Canada's Mineral Treasure Chest

(*Continued from page* 348)

molybdenite concentrates, the platinum metals, selenium, silver, radium, tellurium, tin, etc.

In any event, as a producer of most of the principal metals and minerals, Canada is vitally concerned in all matters likely to affect the outlook for the mineral industry. Dollar parity and high labor costs are currently restricting exploration and development in promising new mining camps. Unfavorable conditions, however, failed to stop one former producer from reopening its plant or to dim the hopes of at least four other companies from considering plans for early milling.

The possibility of harnessing hydro-electric power to provide low mining and ore transportation costs is one of the key factors which will make mining in remote new areas feasible.

The P. A. and the Auditor

(*Continued from page* 122)

review of what has been said so far this evening, I'd like to answer that specific question.

Fundamentally, it is a question Top Management asks of every department in the company, and the answer depends to a large extent on the honesty, integrity and operating methods of the department head. Insofar as the Purchasing Department is concerned, do you have to be an Internal Auditor to answer that part of the question? Not if you *know* the man you are dealing with!

Supposing you don't know him too well, or haven't had an opportunity of getting to know him better, then I suggest that the answer you want will be revealed when you find the answers to these three series of questions:

(A) About the Purchasing Agent himself:

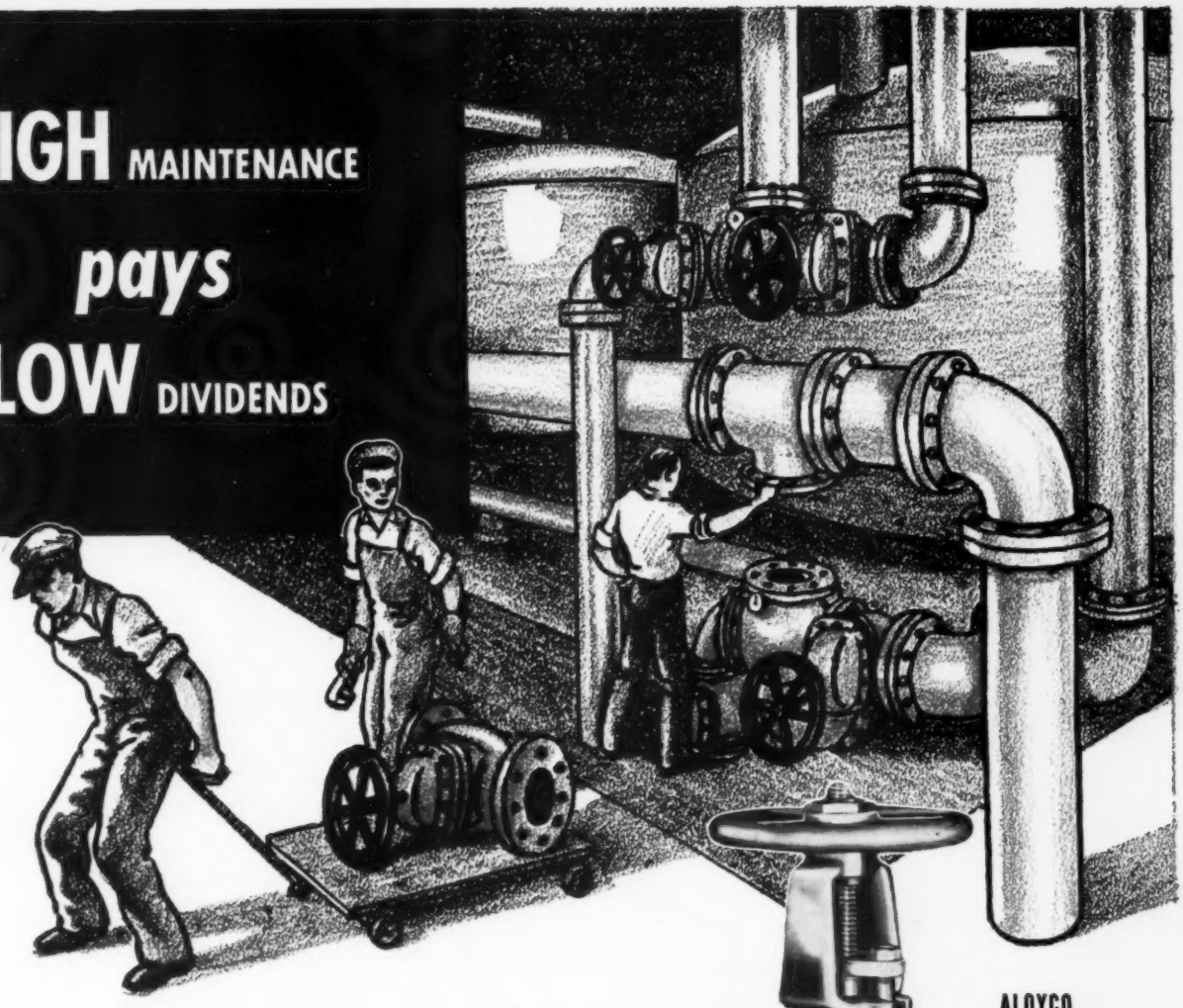
(1) Is he a member of the N.A.P.A.?
(2) Does he subscribe to the high ideals of that Association?
(3) Is he well-regarded by fellow members of his profession?

(B) About the Purchasing Department:

(1) Are operating procedures written out?
(2) Are instructions clear as to getting all bids in writing, and recording prices paid on permanent records?
(3) Have buyers sufficient instructions to guide them, and to

(*Please turn to page* 354)

HIGH MAINTENANCE *pays* LOW DIVIDENDS



ALOYCO GATE VALVE NO. 111

save money with ALOYCO VALVES

● Few manufacturers can afford the luxury of frequent valve replacement. With labor and materials at present day peaks and when down-time is considered the cost of replacing a valve in a corrosive fluid pipe line is excessive.

It pays to install Aloyco Valves in the first place.

The benefit of Aloyco Corrosion Engineering experience is yours for the asking.

ALOYCO

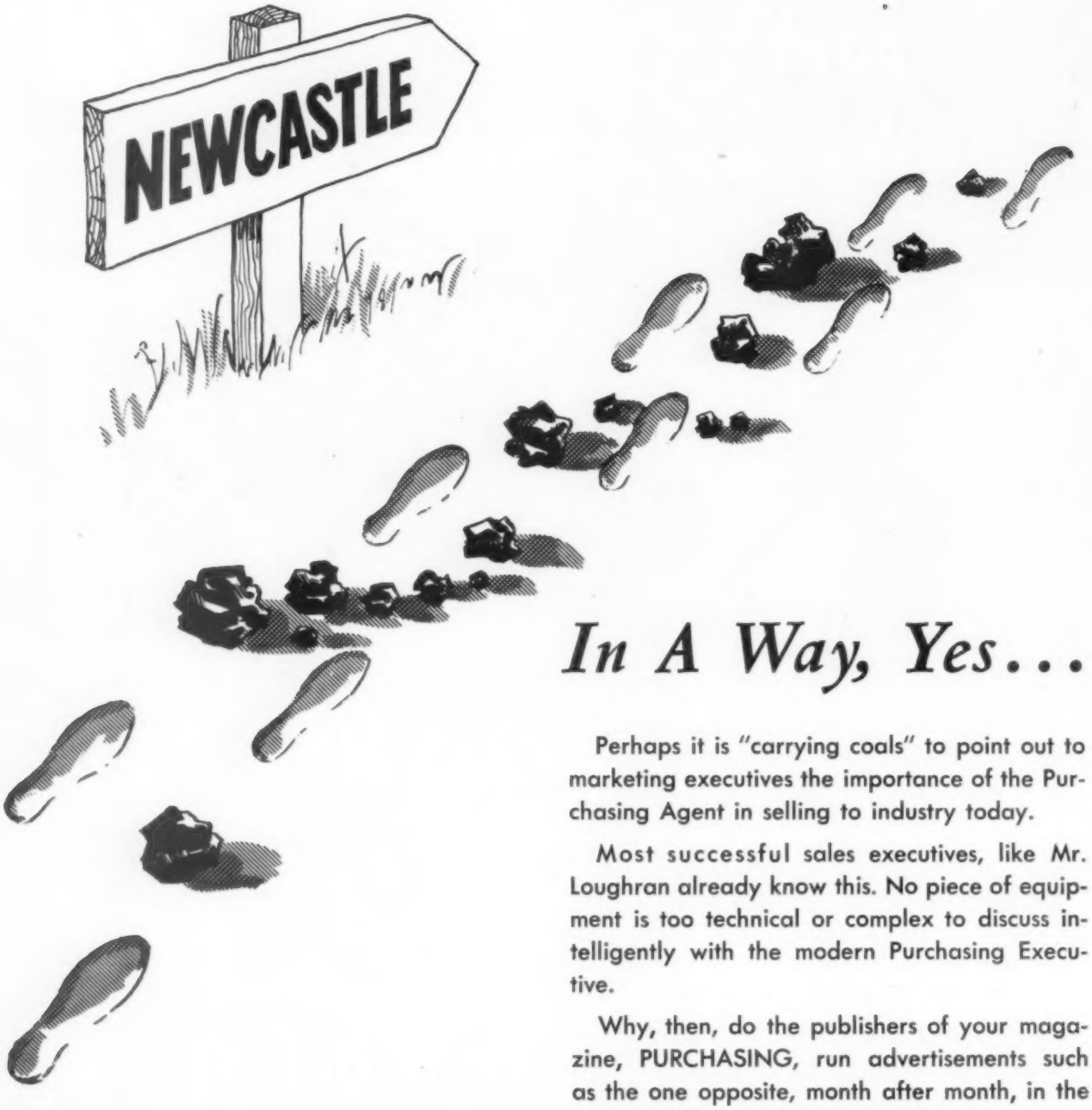
STAINLESS STEEL VALVES AND FITTINGS

GATE, GLOBE, Y, CHECK, TANK, SAMPLING AND V-PORT VALVES
SCREWED AND FLANGED FITTINGS

ALLOY STEEL PRODUCTS COMPANY, INC.

1312 WEST ELIZABETH AVE. • LINDEN, N. J.

SALES OFFICES: ATLANTA; CHICAGO; HOUSTON;
LOS ANGELES; NEW YORK CITY; PITTSBURGH; WILMINGTON, DEL.



In A Way, Yes...

Perhaps it is "carrying coals" to point out to marketing executives the importance of the Purchasing Agent in selling to industry today.

Most successful sales executives, like Mr. Loughran already know this. No piece of equipment is too technical or complex to discuss intelligently with the modern Purchasing Executive.

Why, then, do the publishers of your magazine, PURCHASING, run advertisements such as the one opposite, month after month, in the key marketing magazines of the country?

Because building sound relationships between industrial marketers and purchasing men is PURCHASING Magazine's business.

The importance of the Purchasing Executive
in industrial marketing
cannot be overemphasized

Mr. J. J. Loughran, Sales Manager, Pottstown plant of the Doehler-Jarvis Corporation, world's largest producer and finisher of die castings, goes over the requirements of West Disinfecting Company with Mr. William C. Wallstein, the Purchasing Agent (right).

"The P.A. knows what's needed —make sure he knows YOU"

"THE Purchasing Agent is the key man in selling to industry," says Mr. Loughran, Sales Manager of Doehler-Jarvis Corporation.

"Through the P.A.s, we keep in touch with various die casting requirements, and sales opportunities. For after the designers and engineers develop and complete a die casting specification, it is the purchasing department's job to find a dependable source that can supply the required parts.

"This being the case, it is always important that we keep purchasing agents informed about Doehler-Jarvis qualifications and plant facilities for turning out highest quality die castings."

The most efficient way to do that is through consistent advertising in *Purchasing*. The purchasing executive's own trade paper, information center and "bible", *Purchasing* is read regularly by P.A.s controlling 85% of industry's purchases.

Make sure the Purchasing Agent will see your product when he "goes shopping" — in *Purchasing*. Find out more about industry's *super-market* and how it can lower your selling costs. Write to: *Purchasing*, 205 East 42nd Street, New York 17, N. Y. Offices in Chicago, Cleveland, Los Angeles.

PURCHASING

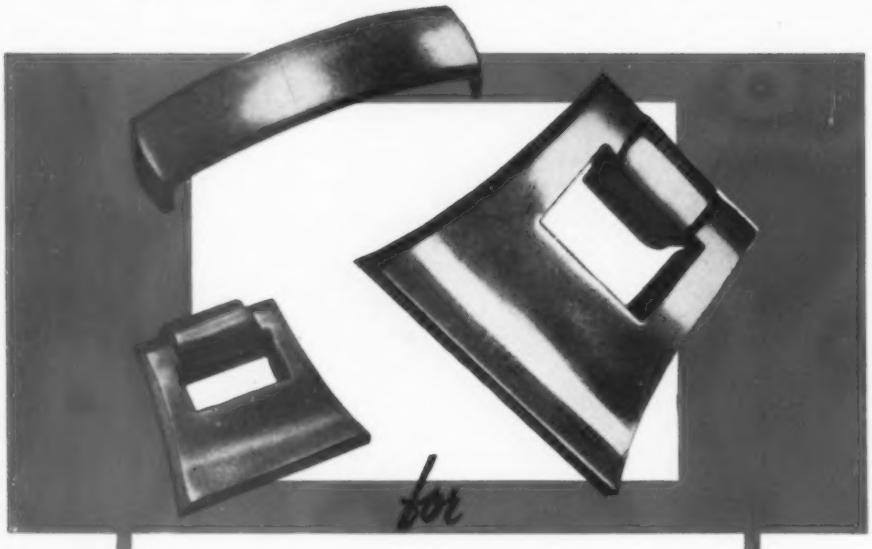
ABC ABP

A CONOVER-MAST PUBLICATION

THE NATIONAL MAGAZINE FOR PURCHASING EXECUTIVES

LEA METHOD
LEA COMPOUND

A Satin Finish at LOWER COST



for

Eveready Hardware Mfg. Co., Inc.
Brooklyn, N. Y.

This attractive furniture and cabinet hardware is produced in four major operations: (1) zinc die cast, (2) Lea flexible polishing (3) brass plating and then (4) Lea Satin Finishing. At Eveready, they are using Lea Compound Grade "N" to remove the residual flash and surface irregularities in a pre-plating polishing operation and then, after brass plating, Lea Compound Grade "A" to produce the Lea Satin Finish.

If your production line includes a polishing or buffing station perhaps the Lea "Flexible" Finishing can also improve the quality of your work and lower your finishing costs. Write us in detail and, if possible, send samples.

THE LEA MANUFACTURING CO.

Burring, Buffing and Polishing Manufacturers and Specialists in the Development of Production Methods, Equipment and Compositions

16 Cherry Ave., Waterbury 86, Conn.

The P. A. and the Auditor

(*Continued from page* 350)

control them?

(C) About the Goods Purchased:

(1) Are all goods received by a department other than Purchasing?

(2) Is inspection and reporting of goods received properly controlled, in a department other than Purchasing?

If the answer is "Yes" in every case, I think both you and the P.A. are to be congratulated. If not, I'd suggest that you get together, as you have a selling job to do on Top Management, for your mutual protection and benefit.

Why Centralize Purchasing?

(*Continued from page* 91)

ment, with signature of the department head to authorize the purchase.

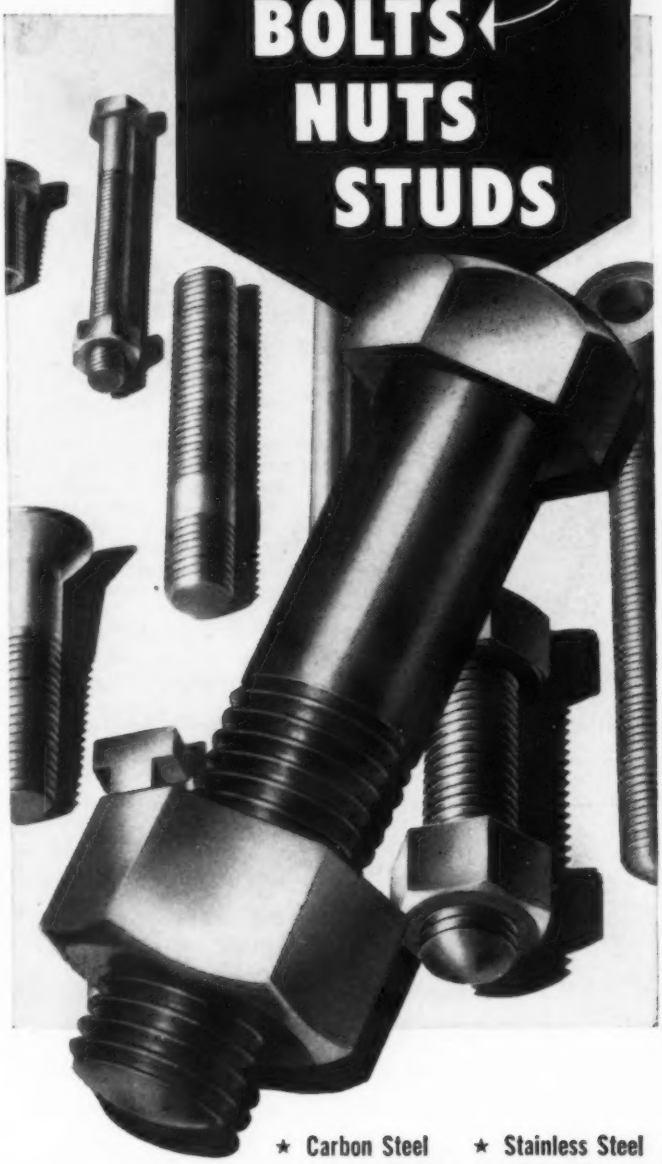
2. A purchase order, requiring the signature of the purchasing officer to obligate the company, and with such number of carbon copies as may be useful in coordinating purchasing procedure with accounting and receiving procedure.

3. A purchase record card for each standard item regularly used, showing sources of supply, ordering information, orders issued, prices paid, and deliveries received.

These records will of course be coordinated with the stores record or perpetual inventory of stock items, and with the system of receiving and reporting deliveries. The purchasing agent will equip himself with a comprehensive directory of manufacturers and build up a file of suppliers' catalogs. As the buying program grows, and as internal company procedure demands, these basic forms and controls may be supplemented by a more extensive system designed to serve specific and repetitive phases of the supply responsibility, but the fundamentals of the buying function may be simply served, and the system should be kept as simple as possible.

Central purchasing is the application of common sense and sound administrative controls and procedure to the problems common to any organization where purchasing is done, and where the need for purchases arises from a variety of departments or sources. These principles can be applied with benefit to any organization, regardless of size. The particular conditions in the individual organization will determine whether purchasing is a full-time job, but in any case the function should be recognized as one calling for specialized and centralized attention.

First for
BOLTS
NUTS
STUDS



★ Carbon Steel
★ Heat-treated Alloy Steels
★ Stainless Steel
★ Silicon Bronze
★ Naval Brass

BETTER BOLTS SINCE 1882

★ Accurately made in standard dimensions or to your own specifications.

USE HEADED AND THREADED FASTENERS FOR ECONOMY AND RELIABILITY

PAWTUCKET

"The Bolt Man"

MANUFACTURING COMPANY

327 Pine Street · Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

"This National Vulcanized Fibre Part solved our problem*— assured us a product which performed perfectly."

* Required:
A material light in weight, resistant to wear, with good dielectric strength, ready machinability. National Vulcanized Fibre with all these qualities, plus—*was the perfect answer.*

In your development of efficient, economical products, it pays to investigate

NATIONAL VULCANIZED FIBRE

A tough, horn-like material with high dielectric and mechanical strength. Excellent machinability and forming qualities, great resistance to wear and abrasion, long life, light weight. Sheets, Rods, Tubes, Special Shapes.

PHENOLITE Laminated PLASTIC

About one-half the weight of aluminum, possesses an unusual combination of properties—a good electrical insulator, great mechanical strength, high resistance to moisture; ready machinability. Sheets, Rods, Tubes, Special Shapes.

PEERLESS INSULATION

The *first* fish paper developed for electrical insulation. Strong, smooth, flexible, with excellent forming qualities. High dielectric strength. Sheets, Rolls, Coils.

To help you solve your specific development problem—National Research and Engineering Service available without obligation.

NATIONAL VULCANIZED FIBRE CO.
WILMINGTON DELAWARE
Offices in Principal Cities
Since 1873

Manufacturer makes big SAVINGS on NUTS!

"WE HAVE LOPPED a big slice from our annual outlay for nuts," reports large appliance manufacturer . . . "By using Westfield Nuts and concentrating on fewer types and sizes. Production was speeded on assembly lines." Westfield Nuts are uniform and accurate. Standard or Custom Made, they're *milled to exact specifications* . . . Send drawings and data for recommendations and prices. Or have a Westfield engineer study your full requirements and suggest improvements and savings that really count. Address Department 606.

WESTFIELD METAL PRODUCTS CO. INC.
WESTFIELD, MASS.

AN AMAZING LUBRICANT

LUBRIPLATE 130-AA

LOOK FOR THIS TRADE MARK

Protects Against Rust and Corrosion

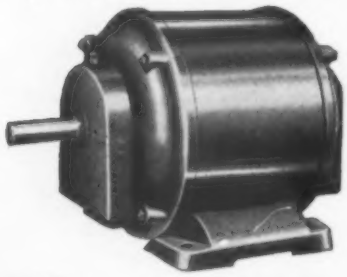
A super grease-type lubricant! A marvelous anti-seize compound and a real protector against rust and corrosion. From the standpoint of general utility and diversity of important uses, LUBRIPLATE 130-AA is unequalled. While it is ideal for the heaviest loads, this remarkable lubricant does not cause drag and actually conserves power. Write for a free copy of the LUBRIPLATE Service Hand Book.

LUBRIPLATE DIVISION
FISKE BROS. REFINING COMPANY
Newark 5, N. J. • Toledo 5, Ohio

DEALERS FROM COAST TO COAST • ***See Your Local Classified Telephone Book***

This MOTOR *comes from a large Family!*

VALLEY Ball Bearing Motors are built in sizes from ½ hp up to 75 hp, providing wide adaptability in power planning. VALLEY'S cool running splash proof, dust proof construction insures long hours of dependable power under the most hazardous conditions.



You'll find the type of Motor you need in your power planning when you investigate VALLEY MOTORS.

VALLEY
ELECTRIC CORPORATION
4221 FOREST PARK BLVD. • ST. LOUIS 8, MO.

ANNOUNCING

An Expanded, Helpful Service to Purchasing Agents and Buyers and Other Department Heads.

The Reader Service Department
of Purchasing Magazine
will procure for you any bulletin, catalog, or printed matter that may be mentioned in any of the editorial or advertising pages of this issue, as well as the catalogs and bulletins listed in the accompanying "Ask Purch" pages.

You merely list your wants by Page Number and name of Product (or company) on the Postage-paid Reader Service Post Cards on Pages 19 and 20.

Thus you can keep your Catalog and Information files up-to-date, with minimum effort on your part. You will save a lot of letter writing and you are assured that our Reader Service Department will give your Postal request immediate attention.

Check Your Wants on the Cards as you
Go through the Pages — That's All.

ORANGE CORE IS QUALITY CONTROLLED

Orange Core gummed sealing tape is so uniformly good, so utterly dependable! From raw pulp to the finished roll, every step in the manufacture of Orange Core is controlled by experts—all in one plant. Made of extra-sturdy kraft and specially processed hi-test animal glue, here's a tape that you can always rely on to moisten fast, stick fast, and hold fast. Quality-controlled Orange Core guarantees top performance from start to finish in your shipping room. Be sure to ask your supplier for this world-renowned sealing tape—it's "America's Most Popular Brand."

SEAL IT RIGHT WITH GUMMED TAPE

ORANGE CORE

Copyr. H. P. & P. Corp.

GUMMED SEALING TAPE

HUDSON PULP & PAPER CORP. • 220 EAST 42nd ST., NEW YORK 17, N.Y.

A SUPERIOR VALVE STEM PACKING

GARLOCK 117—furnished either braided or twisted in all sizes from 1/16" to 3/4", packaged in 1-lb., 2-lb. or 5-lb. spools.

Lasts Longer... Lowers Maintenance Costs!

GARLOCK 117 Valve Stem Packing is manufactured from long fibre asbestos yarn and lubricated with a special heat-resisting compound. Quality controlled from raw material to finished product, GARLOCK 117 gives superior service on all types of valves operating against steam, hot or cold water, or oil. It's economical!

THE GARLOCK PACKING COMPANY
PALMYRA, N. Y.
In Canada: The Garlock Packing Company of Canada Ltd., Montreal, Que.

GARLOCK 117

LETTERS . . .

OEM DISCOUNT

As a subscriber, I should like to have you write me your official definition of an original equipment manufacturer's (O.E.M.) resale discount. The information I want is:

1. Who is entitled to the discount
2. When
3. Why

James E. Kerns, Purchasing Agent
Selas Corporation of America,
Philadelphia 34, Pa.

Your questions cannot be answered specifically so as to apply to all cases, as the resale discount comes within the class of "trade discounts" and as such is a matter of individual company policy. It depends primarily on the company's system of distribution, leading to various "customer classifications" to which varying rates of discount apply. Thus it is a functional discount, as opposed to a quantity discount. Its purpose is to protect established distribution channels, so that a jobber can buy to better advantage than a retailer, and a retailer can buy to better advantage than a consumer, and thus it discourages efforts to short-cut established channels. For this reason it is usually maintained even on direct sales where intermediate distributors do not actually function, and sometimes in such cases the sale is billed through, or credited to, the distributor in whose territory the sale is made. The practice is recognized in law as a legitimate one, provided the discounts are available without discrimination to the manufacturer's customers within any set classification. The two most prevalent ways of getting around this situation are (1) the classification of large quantity users as "national accounts", with an applicable discount equivalent or close to the jobber's or resale discount, with service either direct or through a distributor by special arrangement between the manufacturer and distributor, and (2) cooperative buying by consumers in which the cooperative organization nominally serves as a distributor for its members and gets a distributor's classification.

The answer to your first question, therefore, is that to be "entitled" to the discount, a customer must first establish himself in the proper customer classification of the manufacturer's company. If the classification sought is not in accordance with established functions of distribution, some very special circumstances must be shown, else the manufacturer becomes vulnerable on grounds of discrimination against other customers in a similar position.

The "why" is explained in the first paragraph above.—Ed.

MATERIALS MANAGERS

A. N. Phillips of Stewart-Warner Corporation was our guest here last evening. He suggested that perhaps you could help in either developing or criticizing a concept which, for want of a better title, I am calling "A Philosophy of Materials Management." In this concept purchasing as a function becomes one part in an intricate whole of activities dealing with the movement of material of the right kind to the right place at the right time. You perhaps could tell me how prevalent the term "materials manager" is in industry and give me some other comments on the general subject.

Stanley E. Bryan, Management Dept.
Indiana University
Bloomington, Ind.

The tendency for many years past, with the growth of materials problems along with other phases of industrial operation, has been toward greater functional specialization. Purchasing itself is a product of this process, and it has been continued in the setting up of storeskeeping, inventory control, inspection, and other related functions apart from purchasing. During the war period especially, this trend was particularly strong, with priorities sections, etc., achieving an independent status. There has been a natural effort on the part of personnel in such activities to perpetuate their independent status. Perhaps the outstanding example is the development of Quality Control engineering, an outgrowth of testing and inspection, which has achieved a position of importance in many companies, has a strong national professional association, and has justified itself through real contributions to management and operation through scientific methods of sampling and control. In its actual operations, however, it impinges on both production and purchasing (the latter in the case of receiving inspection and acceptance).

"Materials Management" would seem to reverse this trend in organization, but it would serve a very useful purpose in clarifying and coordinating these various specialized though related functions.

Answering your specific question as to the prevalence of the title "Materials Manager," you will find it in rather common use in the aircraft industry, but with little acceptance outside that field. The reason for this is probably to be found in traditional usage or custom, aircraft being relatively exempt from this because it is a young industry.—Ed.

BOUQUETS, TWO

Enclosed is check for $4 for a monthly subscription for PURCHASING.

I was formerly associated with Deerfield Packing Corporation, Bridgeton, N. J., as Assistant to the President in charge of the Purchasing Department and in that capacity I found your magazine to be extremely helpful and your Conover-Mast Purchasing Directory to be indispensable . . .

I am now in business for myself as a purchasing consultant to the Deerfield Packing Corporation and other interests as well as a buyer for a large number of substantial concerns.

John N. Apgar,
Madison, N. J.

SUBCONTRACTING

I wish to secure references, if possible, to articles which have appeared in PURCHASING within the past several years on the subject of subcontracting.

W. E. Prescott, Purchasing Agent
Kendall Mills,
Paw Creek, N. C.

See these issues of PURCHASING:

May 1942, p 77, "Subcontracting," Wm. R. Hilton
July 1942, p 94, "Plant Conversion and Subcontracting," W. T. Roach & N. A. Mears
Sept. 1942, p 67, "Stanley Plan," H. E. Fleming
Sept. 1942, p 51, "Red Tape Must Go," S. F. Heinritz
Dec. 1942, p 81, "Using Subcontractors to Expand Production Capacity," Fleming
Mar. 1943, p 83, "Small Business Must Survive," A. N. Wecksler
Apr. 1943, p 86, "Prepare for War Contract Renegotiation," E. L. Cady
Oct. 1943, p. 80, "What To Do About Contract Termination," S. F. Heinritz
Feb. 1944, p 87, "Purchasing in Reverse," S. F. Heinritz
Mar. 1944, p 121, "Defrauding Prime Contractor Defrauds Government"
Apr. 1944, p 90, "Helping Sub-Contractors on Termination Costs," W. A. Walter
July 1944, p 89, "Problems of Subcontracting," Wm. T. Roach
June 1945, p 82, "Speed-up in War Contract Termination & Settlement," J. Bonwit
Jan. 1946, p 105, "Plain Talk About Purchasing, S. F. Heinritz
July 1948, p 208, "Steel for the Vendor" (Ford Operations)—Ed.

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S. D.
Everett, Wash.

I should like to see some letters from purchasing agents on the West Coast as to just how they are combatting the new steel basing prices and the success they are having.

A. M. Routh, Purchasing Agent,
Woolridge Mfg. Co.,
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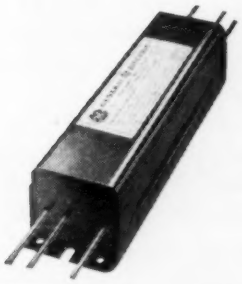

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Advertisers IN THIS ISSUE

A

Abrasive Products, Inc. 230
Accurate Spring Mfg. Co. 312
Acme Steel Co. 69
Adam Electric Co., Frank 281
Air Express Div., Railway Express Agency, Inc. 334
Air Reduction Sales Co. & Subsidiares 349
Aircraft-Marine Products, Inc. 328
Alemite Div., Stewart-Warner Corp. 239
Allegheny Ludlum Steel Corp. 188
Allmetal Screw Products, Inc. 304
Alloy Steel Products Co. 351
Aluminum Co. of America
Customer Relations 337
Distributors 291
Aluminum Goods Mfg. Co. 155
American Brake Shoe Co. 340
American Chain Div., American Chain & Cable Co., Inc. 344
American Chain & Cable Co., Inc. 198, 210, 344
American Hoist & Derrick Co. 328
American Mfg. Co. 66
American Optical Co. 48
American Rivet Co. 294
American Screw Co. 214
American Steel & Wire Co. 180, 181, 203
Amgears, Inc. 336
Ampco Metal, Inc. 202
Angelica Jacket Co. 74
Arabol Mfg. Co., The 160
Arcos Corporation 204
Armour Sandpaper Works 162
Armstrong-Bray & Co. 346
Armstrong Bros. Tool Co. 168
Associated Spring Corp. 28
Atkins & Co., E. C. 37
Atlantic Steel Company 228

B

Babcock & Wilcox Tube Co. 26
Barnes Co., Wallace 28
Barnes Co., Ltd., Wallace, The 28
Barnes-Gibson-Raymond 28
Bassett Co., W. E. 324
Bassick Co., The 366
Bath Co., Inc., John 59
Bay State Tap & Die Co. 182
Behr-Manning Corp. 81
Bemis Bro. Bag Co. 22
Bendix Aviation Corp., Scintilla Magneto Div. 49
Bethlehem Steel Co. 197
Billings & Spencer Co. 77
Blake & Johnson Co., The 171
Bond Foundry & Machine Co. 158
Bridgeport Brass Co. 243
Brighton Screw & Mfg. Co. 348
Brown & Sharpe Mfg. Co. 45
Brownville Paper Co. 254
Buffalo Bolt Co. 42
BullDog Electric Products Co. 267
Bundy Tubing Co. 268
Bunting Brass & Bronze Co. 61

C

Carpenter Alloy Tube Div. 236
Celanese Chemical Div., Celanese Corp. of America 41
Central Paper Co. 200
Central Paper Co., Inc. 350
Central Screw Co. 315
Century Electric Co. 3
Chase Bag Co. 318
Chase Brass & Copper Co., Inc. 179
Chicago Eye Shield Co. 348
Chicago Rawhide Mfg. Co. 215
Chicago Wheel & Mfg. Co. 174
Cities Service Cos. 223
Clark Bros. Bolt Co. 270
Clark Industrial Truck Div., Clark Equipment Co. 290
Classified Advertising Section 360
Clemson Bros., Inc., ... 320
Cleveland Cap Screw Co. 322
Cleveland Container Co., The 288
Cleveland Twist Drill Co. 319
Coffing Hoist Co. 156
Cold Metal Products Co. 303
Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div. 36, 44
Colson Corporation, The 240
CONOVER-MAST PURCHASING DIRECTORY 254
Container Corp. of America 213
Continental Diamond Fibre Co. 18
Cooper Alloy Foundry Co. 363
Corbin Screw Corp. 282
C-O-Two Fire Equipment Co. 302
Crane Co. 217

D

Darling Valve & Mfg. Co. 47
Darnell Corp., Ltd. 318
Dayton Rubber Mfg. Co. 71
Diebold Inc. 244
Disston & Sons, Inc., Henry 27
Dodge Mfg. Co. 309
Dolge Co., C. B. 320
Dominion of Canada, Dept. of Trade & Commerce 54
Dravo Corp. 216
Dunbar Bros. Co. Div. 28
du Pont de Nemours & Co. (Inc.), E. I., Plastics Dept. 269

E

Eagle Mfg. Co. 216
Eaton Mfg. Co., Foundry Div. 60
Eberhard-Faber Pencil Co. 250
Edmont Mfg. Co. 312
Elco Tool & Screw Corp. 342
Electric Storage Battery Co. 283
Electric Wheel Company 232
Elwell-Parker Electric Co. 8
Emerson Electric Mfg. Co. 222
Equitable Paper Bag Co. 252
Erie Bolt & Nut Co. 338
Esleeck Mfg. Co. 262
Etching Co. of America 212
Ex-Cell-O Corporation 153

F

Fafnir Bearing Co. 211
Fairbanks, Morse & Co. 43
Fastener Corporation 190
Federal Electric Products Co. 163
Federated Metals Div., American Smelting & Refining Co. 341
Felters Company 330
Ferry Cap & Set Screw Co. 70
Fiske Bros. Refining Co., Lubriplate Div. 356
Forest City Foundries Co. 308
Formica Insulation Co. 200
Foster Co., L. B. 62
Frasse & Co., Inc., Peter A. 331
Fuller Brush Co. 218

G

Gair Company, Inc., Robert 311
Garlock Packing Co. 357
Gates Rubber Co. 32
General Box Co. 63
General Electric Co.
Apparatus Div. 226, 227, 287, 359
Construction Materials Div.....169, 177, 273
Permanent Magnets 31
General Electric Co., Lamp Div. 149
General Tire & Rubber Co. 170
Gerson-Stewart Corporation 232
Gibson Co., William D., The 28
Gits Bros. Mfg. Co. 201
Globe Steel Tubes Co. 176
Goodrich Co., B. F. 4
Gould Storage Battery Corp. 265
Graybar Electric Co., Inc. 82
Great Lakes Steel Corp. 145
Greenfield Tap & Die Corp. 53
Grinnell Co., Inc. 275

H

Hanson-Van Winkle-Munning 304
Hanson-Whitney Machine Co. 191
Harper Co., H. M. 205
Herbrand Div., Bingham-Herbrand Corp. 172
Hinde & Dauch Paper Co. 29
Hines Lumber Co., Edward 343
Hobbs Mfg. Co. 346
Holliston Mills, Inc., The 364
Hood Rubber Co. 336
Hotel Hollenden 252
Howard Paper Co. Div., Howard Paper Mills, Inc. 257
Hudson Pulp & Paper Corp. 321, 357
Hussey & Co., C. G. 289

I

Illinois Coil Spring Co. 306
Ingersoll Steel Div., Borg-Warner Corp. 338
Inland Steel Co. 5
International Paper Co. 253
International Rolling Mill Products Corp. 272

J

Jelliff Co., C. O. 336
Jenkins Bros. .....4th Cover

K

Keasbey & Mattison Co. 175
Keuffel & Esser Co. 166, 167
Kewaunee Mfg. Co. 350
Kex National Service 292
Keystone Steel & Wire Co. 316
Kimberly-Clark Corp. 221, 326, 327
Kurz-Kasch, Inc. 40

L

Ladish Co. 231
Laminated Shim Co., Inc. 276
Lamson & Sessions Co. 233
Lea Mfg. Co. 354
Levinson Steel Sales Co. 346
Link-Belt Co. 11
Lubriplate Div., Fiske Bros. Refining Co. 356
Lunkenheimer Co. 310
Lyon Metal Products, Inc. 57

M

MacRae's Blue Book 260
Magnus Chemical Co. 278
Marathon Foundry & Machine Co. 192
Master Electric Co. 51
Maxwell Paper Co. Div., Howard Paper Mills Inc. 258
Mayers Co., L. & C. 256
Mercury Printing Company 247
Meyercord Co. 219
Micro Switch 39
Midwest Piping & Supply Co. 161
Milford Rivet & Machine Co. 228
Millers Falls Co. 184
Mills Corporation, Elmer E. 159
Milwaukee Dustless Brush Co. 154
Missouri-Kansas-Texas Lines 280
Monsanto Chemical Co. 183
Moore Business Forms, Inc. 251
Moore & Thompson Div., Hudson Pulp & Paper Corp. 357
Morse Chain Company 314
Murray Co., A. B. 224

N

National Blank Book Company 261
National Electric Products Corp. 345
National Forge & Ordnance Co. 75
National Paper Box Manufacturers Association 237
National Sanitary Supply Assn. 224
National Screw & Mfg. Co. 220
National Supply Co., Spang-Chalfant Div. 33
National Vulcanized Fibre Company 355
Newark Wire Cloth Co. 234
Nicholson File Co. 13
Norma-Hoffmann Bearings Corp. 50
Norton Co. 73, 81

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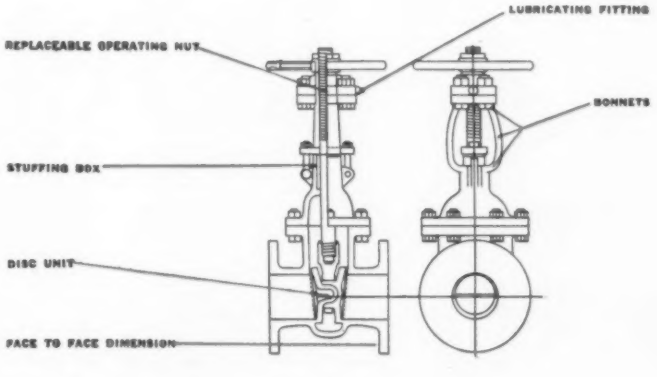

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Oakite Products, Inc. 165
Ohio Brass Company 285
Chio Div., Association Spring Corp. 28
Okonite Co. 284
Old Dominion Box Co., Inc. 329
Old Town Ribbon & Carbon Co., Inc. .. 256
Oliver Iron & Steel Corp. 164
Osborn Mfg. Co. 7
Oxford Filing Supply Co. 252

P

Page Fence Association 278
Page Steel & Wire Div. 210
Parker-Kalon Corp. 64
Pawtucket Mfg. Co. 355
Pittsburgh Plate Glass Co., Brush Div. 333
Pittsburgh Plate Glass Co., Columbia Chemical Div. 86
Plumb, Inc., Fayette R. 157
Plymouth Cordage Co. 79, 80
Powell Co., William 339
Pratt & Whitney, Div., Niles-Bement-Pond Co. 34
PURCHASING Magazine 352, 353
Purdy & Co., Inc., A. R. 323
Pyott Foundry & Machine Co. 326

R

Railway Express Agency, Inc., Air Express Div. 334
Rathborne, Hair & Ridgway Co. 76
Raymond Mfg. Co. 28
Reliance Electric & Engineering Co. 235
Remington Rand, Inc. 249
Republic Rubber Division 317
Republic Steel Corp. 300
Revere Copper & Brass Inc. 206
Reyburn Mfg. Co., Inc. 240
Rhode Island Tool Co. 324
Richardson Co., The 347
Ridge Tool Co. 332
Rising Paper Co. 260
Roebling's Sons Co., John A. 147, 307
Rollway Bearing Co. 286
Rolock, Inc. 295
Ryerson & Son, Inc., Joseph T. 88

S

Safety & Maintenance Co., Inc. 277
Sandvik Steel, Inc. 46
Seymour Mfg. Co., The 335
Sheldon Machine Co., Inc. 364
Sheppard Envelope Co. 256
Sherman Paper Products Corp. 35
Simonds Abrasive Co. 305
Simonds Gear & Mfg. Co. 168
Simonds Saw & Steel Co. 6
Socony-Vacuum Oil Co., Inc. 9
Solvay Sales Div., Allied Chemical & Dye Corp. 189
Sponge Rubber Products Co. 24
Standard Pressed Steel Co. 288
Standard Tube Co. 38
Stanley Electric Tool Div. 10
Starrett Co., L. S. 84
Sterling Bolt Co. 21
Stokes Machine Co. F. J. 271
Strathmore Paper Co. 263
Strom Steel Ball Co. 270
Stuart Oil Co., Ltd., D. A. 306
Sturtevant Mill Co. 56
Sun Oil Co. 297
Superior Foundry, Inc. 186
Superior Steel Corp. 313
Superior Tube Co. 274
Swift & Company 293

T

Taylor Co., Halsey W. 156
Templeton Kenly & Co. 168
Texas Co. ..... 2nd Cover
Thermoid Co. 199
Thompson & Son Co., Henry G. 238
Timken Roller Bearing Co. 207
Titeflex, Inc. 270
Towmotor Corp. 190
Triner Scale & Mfg. Co. 216
Triplex Screw Co. 178
Trumbull Electric Mfg. Co. 65
Tube-Turns, Inc. 365

U

Uarco, Inc. 255
Udylite Corp. 55
Union Bag & Paper Corp. 173
U. S. Steel Supply Co. 15
United States Envelope Co. 262
United States Gauge Div., Amer. Machine & Metals, Inc. 225

V

Valley Electric Corp. 356
Van Dorn Electric Tool Co. 25
Veeder-Root, Inc. 72
Vimco Mfg. Co. 228

W

Wagner Electric Corp. 58
Walworth Co. 30
Wayne Pump Co., The 187
Webster Co., F. S. 259
Weirton Steel Co. 279
West Disinfecting Co. 301
Westfield Metal Products Co., Inc. 356
Westinghouse Electric Corp. ....193, 194, 195, 196, 208, 209, 3rd Cover
Westinghouse Electric Corp., Lamp Div. 299
Wheeler Reflector Co. 17
Whitney Chain & Mfg. Co. 325
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. 36, 44
Williams & Co., J. H. 229
Willys-Overland Motors, Inc. 52
Wirebound Box Manufacturers Asso. 185
Wisconsin Motor Corp. 294
Worcester Pressed Steel Co. 78

Y

Yale & Towne Mfg. Co. 23
Youngstown Sheet & Tube Co. 151

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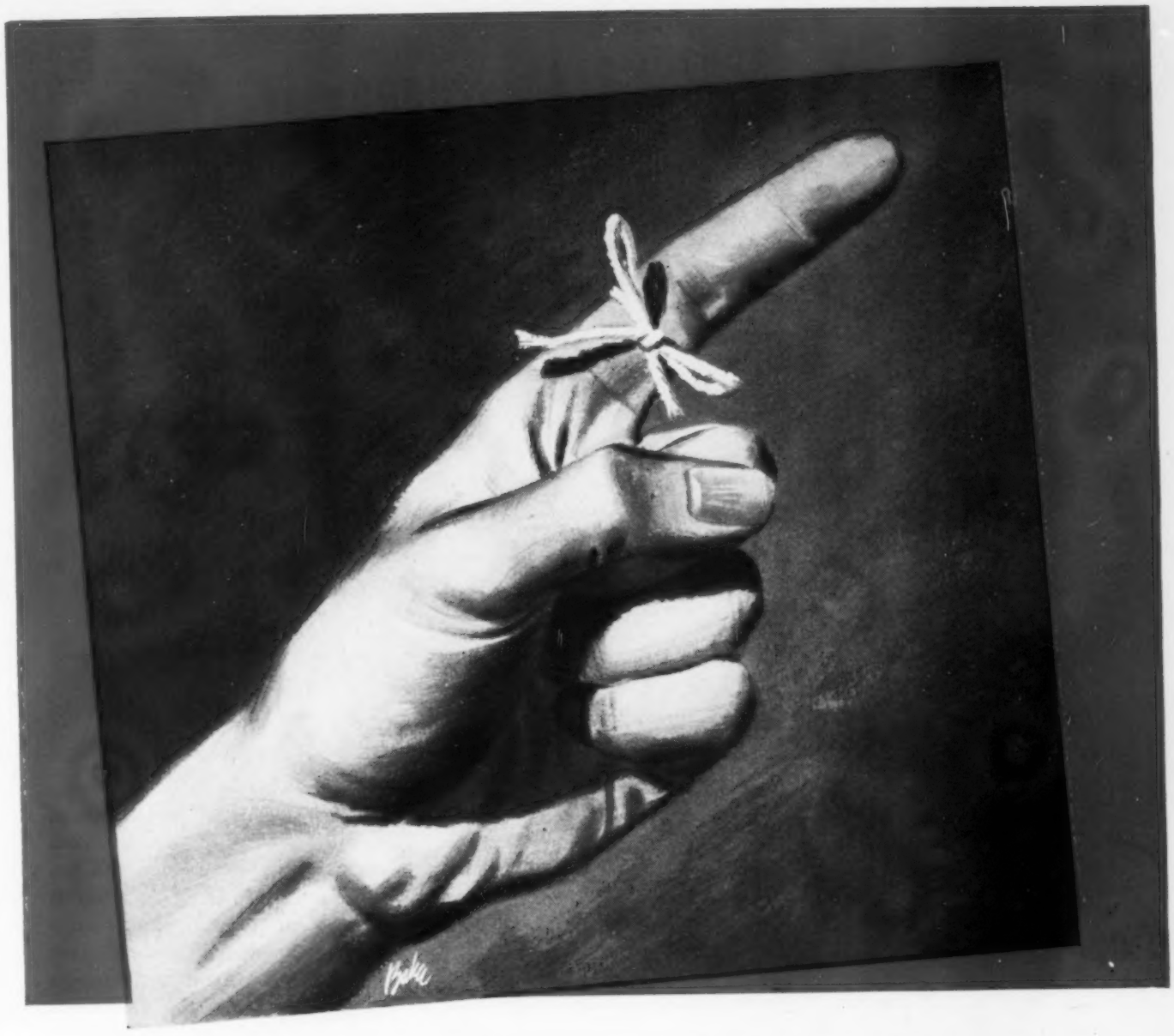

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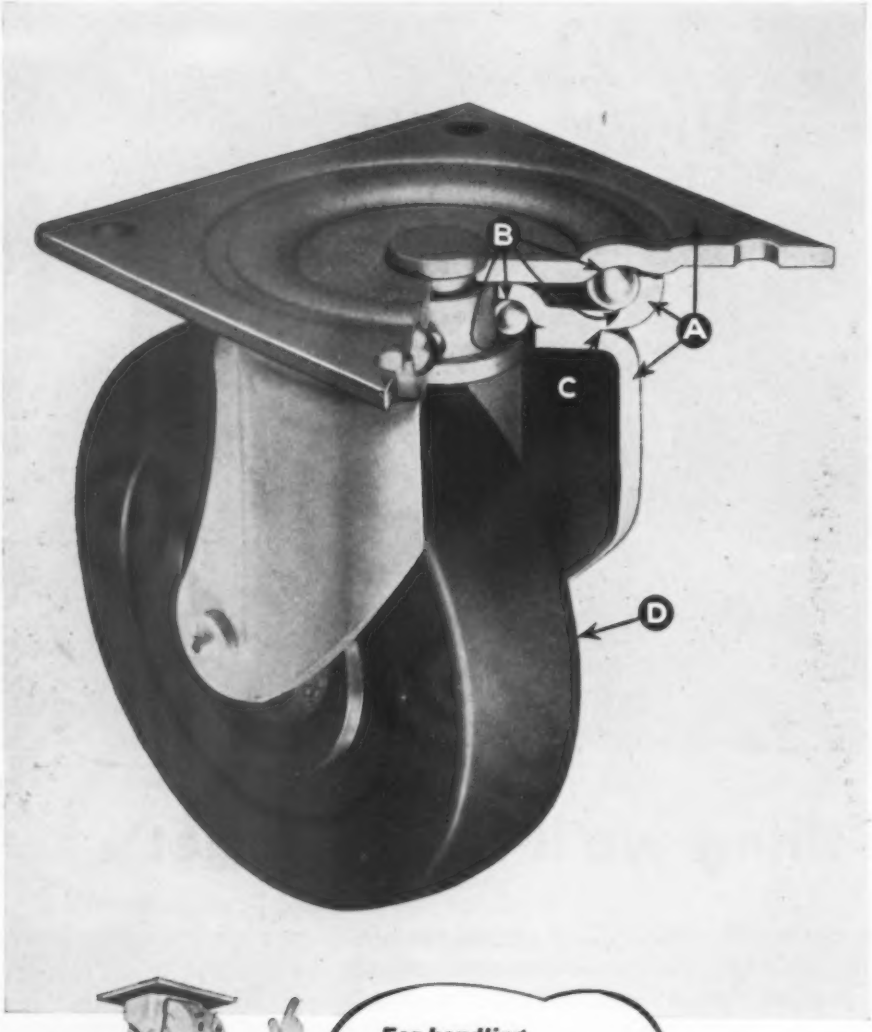

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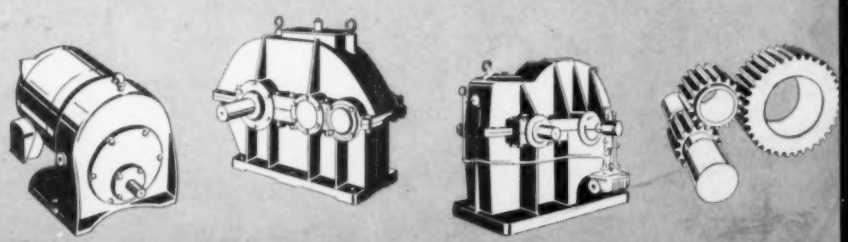

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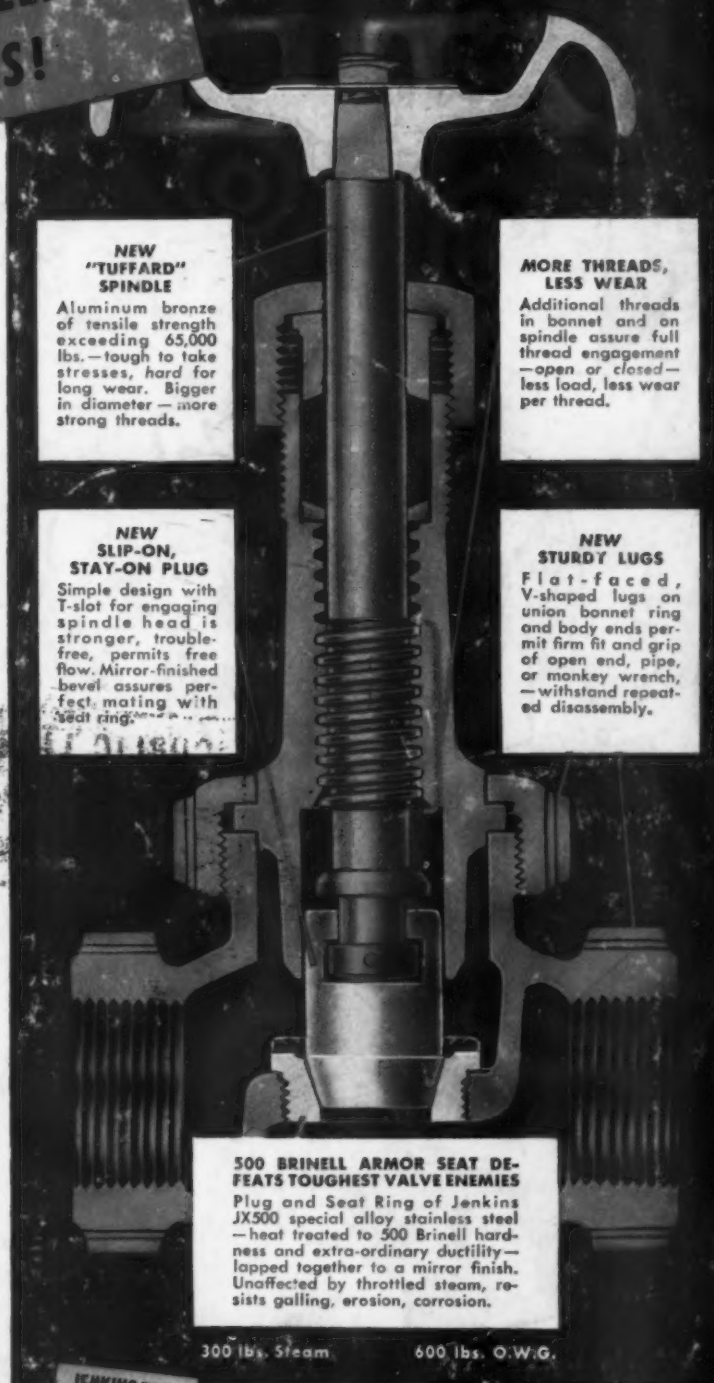
JENKINS ANSWER TO VALVE-KILLING SERVICES!

JENKINS Fig. 976-A

PLUG TYPE

Armor Seat

BRONZE GLOBE VALVE



NEW "TUFFARD" SPINDLE

Aluminum bronze of tensile strength exceeding 65,000 lbs.—tough to take stresses, *hard* for long wear. Bigger in diameter—more strong threads.

MORE THREADS, LESS WEAR

Additional threads in bonnet and on spindle assure full thread engagement—*open or closed*—less load, less wear per thread.

NEW SLIP-ON, STAY-ON PLUG

Simple design with T-slot for engaging spindle head is stronger, trouble-free, permits free flow. Mirror-finished bevel assures perfect mating with seat ring.

NEW STURDY LUGS

Flat-faced, V-shaped lugs on union bonnet ring and body ends permit firm fit and grip of open end, pipe, or monkey wrench,—withstand repeated disassembly.

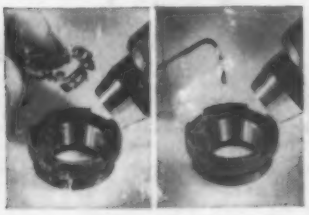
500 BRINELL ARMOR SEAT DEFEATS TOUGHEST VALVE ENEMIES

Plug and Seat Ring of Jenkins JX500 special alloy stainless steel—heat treated to 500 Brinell hardness and extra-ordinary ductility—lapped together to a mirror finish. Unaffected by throttled steam, resists galling, erosion, corrosion.

300 lbs. Steam 600 lbs. O.W.G.

BUILT TO BREAK RECORDS FOR LONG LIFE

Now, for the most severe services, you can choose the new Jenkins Fig. 976-A with complete confidence that it will set new economy records. Use it for pressure regulation, bleeds, drips, air drains, or any close regulation of steam that threatens wire drawing. It will lower maintenance, last longer, where entrapped pipe chips, scale, or rust tubercles are a problem.



SMASHED PIPE CHIPS, WIRE, LEAVE NO SCARS

Steel pipe chips and 1/16" wire rod, with Brinell hardness in excess of 300, were crushed between the new Jenkins JX500 Plug and Seat Ring without leaving a scratch or dent. That's proof of super hardness!

Compare Fig. 976-A, part for part, and see why it's as nearly wear-proof, trouble-proof, and maintenance-free as any stock valve can be. Only a few of the dozen ways it's better are shown here. Get the complete story in the new folder. See why it's unrivalled for endurance and economy,—why it's your best buy in plug-type valves! Use coupon.

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